

Exhibit C

(REDACTED VERSION OF
DOCUMENT TO BE SEALED)

Exhibit 36

(Submitted Under Seal)

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UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF MICHIGAN

JASON COUNTS, et al.,)
individually, and on behalf)
of THEMSELVES AND ALL) C.A. No.
OTHERS similarly situated,) 1:16-cv-12541-TLL-PTM
Plaintiffs,)
vs.)
GENERAL MOTORS LLC, ROBERT)
BOSCH GMBH, and ROBERT)
BOSCH LLC,)
Defendants.)

PART II of the videotaped videoconference
deposition of JUSTON SMITHERS, called for
examination pursuant to the Rules of Civil
Procedure for the United States District Courts
pertaining to the taking of depositions, taken on
the 21st day of May, 2020, at the hour of
11:00 a.m.

* * * HIGHLY CONFIDENTIAL * * *

Reported by: Gina M. Luordo, CSR, RPR, CRR

License No.: 084-004143

APPEARING REMOTELY FROM COOK COUNTY, ILLINOIS

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<p>1 REMOTE APPEARANCES 2 HAGENS BERMAN SOBOL SHAPIRO LLP 3 BY: MR. GARTH WOJTANOWICZ 1301 Second Avenue Suite 2000 4 Seat le, Washington 98101 (206) 623-7292 5 garthw@hbsslaw.com 6 - and - 7 CARELLA, BYRNE, CECCHI, OLSTEIN, BRODY & AGNELLO, PC 8 BY: MR. JAMES E. CECCHI 5 Becker Farm Road 9 Roseland, New Jersey 07068 (973) 994-1700 10 jecchi@carellabyrne.com 11 - and - 12 SEAGER WEISS LLP BY: MS. SHAUNA ITRI 13 55 Challenger Road, 6th Floor Ridgefield Park, New Jersey 07660 14 (973) 639-1000 sitri@seegerweiss.com 15 Representing the Plaintiffs; 16 KIRKLAND & ELLIS LLP BY: MS. RENEE D. SMITH MR. JEFFREY S. BRAMSON MS. KATE WARNER 300 Nor h LaSalle Street 19 Chicago, Illinois 60654 (312) 862-2000 20 renee.smith@kirkland.com jeffrey.bramson@kirkland.com kate.warner@kirkland.com 21 Representing General Motors LLC;</p>		<p>1 I N D E X 2 WITNESS EXAMINATION 3 JUSTON SMITHERS 4 By Mr. Brodsky 261 5 By Ms. Smith (further) 403 6 7 8 9 E X H I B I T S 10 NUMBER IDENTIFICATION PAGE 11 Exhibit 36 Analyzing On-Road Emissions 279 12 Of Light-Duty Vehicles 13 With Portable Emission 14 Measurement Systems (PEMS) 15 Exhibit 37 On-Road and Chassis 301 16 Dynamometer Evaluations of 17 Emissions from Two Euro 6 18 Diesel Vehicles 19 Exhibit 38 CAFE In-Use Emissions 302 20 Testing of Light-Duty 21 Diesel Vehicles in the 22 United States 23 Exhibit 39 AECD Documentation Bates 336 24 GMCOUNTS000096434-96523 25</p>
<p>1 REMOTE APPEARANCES (continued): 2 CLEARY GOTTLIEB STEEN & HAMILTON LLP BY: MR. DAVID E. BRODSKY 3 One Liberty Plaza New York, New York 10006 4 (212) 225-2000 dbrodsky@cgsh.com 5 - and - 6 McQUAIDE BLASKO BY: MR. STEVEN S. HURVITZ 811 University Drive 8 State College, Pennsylvania 16801 (814) 238-4926 9 sshurvitz@mqblaw.com Representing Robert Bosch GMBH and 10 Robert Bosch LLC. 11 * * * * * 12 13 14 15 16 17 18 19 20 21 22 23 Also Present: Mr. Travis Jewell - Videographer 24 Mr. Donald Eklund 25 Mr. David Anderson</p>	Page 256	<p>1 E X H I B I T S 2 NUMBER IDENTIFICATION PAGE 3 Exhibit 40 MY14 Chevy Cruze Diesel 378 4 LUZ - Final Report UHC 5 Exhibit 41 Deposition Transcript of 420 6 Andrew S. Barren 7 Exhibit 42 Catalyst Test Services 427 8 LLC Standard Operating 9 Procedure 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25</p>

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<p>1 THE VIDEOGRAPHER: We are now on the record. 2 Participants should be aware that this proceeding 3 is being recorded, and as such, all conversations 4 held will be recorded unless there's a request and 5 agreement to go off the record. Private 6 conversations and/or attorney-client interactions 7 should be held outside the presence of the remote 8 interface.</p> <p>9 A link to the recording will be available 10 to all parties to the case for up to 90 days from 11 today's date provided the requesting party has 12 purchased a certified copy of the transcript.</p> <p>13 This is the remote video recorded 14 deposition or Juston Smithers, volume 2 being taken 15 on Thursday, May 21, 2020. The time is now 16:01 16 in the UTC time zone. We are here in the matter of 17 Counts, et al. v. General Motors LLC, et al. My 18 name is Travis Jewell, remote video technician on 19 behalf of U.S. Legal Support located at 200 West 20 Jackson, Chicago, Illinois. I'm not related to any 21 party in this action nor am I financially 22 interested in the outcome.</p> <p>23 At this time will the court reporter, Gina 24 Luordo on behalf of U.S. Legal Support please enter 25 the statement for remote proceedings into the</p>	<p>1 JUSTON SMITHERS, 2 having been previously duly sworn, was examined and 3 testified as follows:</p> <p>4 EXAMINATION</p> <p>5 BY MR. BRODSKY:</p> <p>6 Q. Mr. Smithers, do you understand you're 7 still under oath?</p> <p>8 A. Yes.</p> <p>9 Q. Okay. I think we can proceed. Good 10 morning, Mr. Smithers.</p> <p>11 A. Good morning.</p> <p>12 Q. Yesterday you testified about your 13 reliance on data collected at temperatures outside 14 the written specified operating conditions of your 15 PEMS equipment. Do you recall that testimony?</p> <p>16 A. I recall reviewing --</p> <p>17 THE COURT REPORTER: I'm sorry. Could you 18 repeat that answer? There was some interference. 19 I'm sorry about that.</p> <p>20 THE WITNESS: Yeah. No problem. I recall 21 reviewing the temperatures where we ran the test 22 and the temperature limits of the equipment.</p> <p>23 BY MR. BRODSKY:</p> <p>24 Q. And in that connection, you claim that you 25 operated the equipment in consultation with the</p>
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<p>1 record.</p> <p>2 THE COURT REPORTER: The attorneys 3 participating in this deposition acknowledge that I 4 am not physically present in the deposition room 5 and that I will be reporting this deposition 6 remotely, pursuant to Federal Rule of Civil 7 Procedure 29. They further acknowledge that, in 8 lieu of an oath administered in person, the witness 9 will verbally declare his testimony in this matter 10 is under penalty of perjury. The parties and their 11 counsel consent to this arrangement and waive any 12 objections to this manner of reporting.</p> <p>13 Please indicate your agreement by stating 14 your name and your agreement on the record.</p> <p>15 MR. WOJTANOWICZ: This is Garth Wotjanowicz for 16 plaintiffs. We agree.</p> <p>17 MR. BRODSKY: David Brodsky for Robert Bosch 18 LLC. We agree.</p> <p>19 MS. SMITH: This is Renee Smith on behalf of 20 General Motors LLC. We agree.</p>	<p>1 manufacturer and that they felt comfortable with 2 what you were doing. Do you recall that testimony?</p> <p>3 A. I do.</p> <p>4 Q. The manufacturer that you discussed this 5 with is Sensors, Inc. That's the manufacturer of 6 the PEMS testing equipment?</p> <p>7 A. It is.</p> <p>8 Q. Who at Sensors, Inc. did you have that 9 discussion with?</p> <p>10 A. I would have to ask one of my engineers, 11 but I would like to make a point of clarification 12 that I think is relevant, and that is the PEMS 13 equipment that you listed yesterday that we went 14 through that has the ambient temperature limitation 15 was all stored inside of the passenger compartment 16 of the car, and so it was at a comfortable 17 temperature for the drivers. So it was not at 18 temperatures of the outside ambient air.</p> <p>19 Q. Do you have a record of what the 20 temperatures were in the compartment?</p> <p>21 A. I don't, but I assume that my operators 22 were running it at comfortable temperatures 23 probably somewhere between 65 and 70 degrees.</p> <p>24 Q. So you didn't have the conversations with 25 Sensors, Inc. that you referred to yesterday?</p>

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<p>1 A. We did have conversations, and those 2 conversations related to the exhaust flow meter, 3 which is outside of the car. That has no lower 4 ambient temperature specification that I'm aware 5 of, but they did have some condensation issues in 6 the flow tube, and those were resolved in 7 discussion with Sensors, Inc.</p> <p>8 Q. Before we get to the condensation issue, 9 I'm referring to the conversations that you said 10 you had with the manufacturer. And am I to 11 understand that you did not personally have those 12 conversations?</p> <p>13 A. My engineers had the conversations with 14 Sensors.</p> <p>15 Q. Which engineers?</p> <p>16 A. It would have been Max or Thomas most 17 likely.</p> <p>18 Q. Do you know for sure?</p> <p>19 A. I don't know which of the two.</p> <p>20 Q. Were the conversations in person?</p> <p>21 A. Over the phone.</p> <p>22 Q. Most likely?</p> <p>23 A. Most likely.</p> <p>24 Q. Do you know for sure?</p> <p>25 A. I don't.</p>	<p>1 A. Right. 2 Q. What does that mean? 3 A. You can get condensation inside of the 4 flow tube of the exhaust flow meter, and I don't 5 recall specifically if this was related to the 6 Cruze or one of the other vehicles. In fact, I'm 7 merely confident it did not relate to the Cruze 8 because the Cruze has a horizontal orientation, and 9 that actually eliminates the condensation issue. 10 So as I'm thinking about it now, I believe that was 11 only in cases where the exhaust flow meter had a 12 vertical orientation, which is not the Cruze.</p> <p>13 Q. So your reference to a condensation issue 14 yesterday with regard to the Cruze was mistaken?</p> <p>15 A. Yes. After I thought about the different 16 vehicles we've tested at low temperature, that was 17 not an issue with the Cruze.</p> <p>18 Q. Okay. Yesterday we talked about the SC03 19 test that was run at the TRC on March 19, 2018. Do 20 you remember that testimony?</p> <p>21 A. I do.</p> <p>22 Q. And you said that the test was 23 noncompliant because the TRC didn't have the right 24 solar array, correct?</p> <p>25 A. Right.</p>
<p>1 Q. Did the engineers take notes of the 2 conversations?</p> <p>3 A. I'm not sure.</p> <p>4 Q. And your testimony yesterday was that the 5 manufacturer felt comfortable with what you were 6 doing. Do you know what that means, or what does 7 that mean that they felt comfortable?</p> <p>8 A. They felt that their system would perform 9 properly in the conditions where we were running 10 it.</p> <p>11 Q. Did they assure you that the data you 12 collected in those conditions would be accurate and 13 reliable?</p> <p>14 A. I'd have to go back and ask Max exactly 15 the words that were said, but they gave us a good 16 degree of comfort that their systems would work 17 properly at the temperatures we were testing.</p> <p>18 Q. And again, you didn't have those 19 conversations, so what you're testifying to is 20 based on conversations you had with Max or, I think 21 you gave a second name, Thomas?</p> <p>22 A. Right.</p> <p>23 Q. Now, you did say that when operating 24 conditions below 14 degrees Fahrenheit, your team 25 had some problems with condensation, correct?</p>	<p>1 Q. Besides that attempted SC03 test on 2 March 19th, did you run any other SC03 test on the 3 Cruze test vehicle?</p> <p>4 MR. WOJTANOWICZ: Object to the form.</p> <p>5 THE WITNESS: I believe we tried to simulate 6 one on the road if my memory serves, but I don't 7 recall specifically.</p> <p>8 BY MR. BRODSKY:</p> <p>9 Q. Did you identify that attempt in your 10 report?</p> <p>11 A. No. We didn't think it was particularly 12 illustrative or relevant.</p> <p>13 Q. Did you provide any data about that 14 attempted test?</p> <p>15 A. That data is included in the data that was 16 supplied.</p> <p>17 Q. Could you tell me where -- what date that 18 attempted test occurred?</p> <p>19 A. September 7, 2018.</p> 

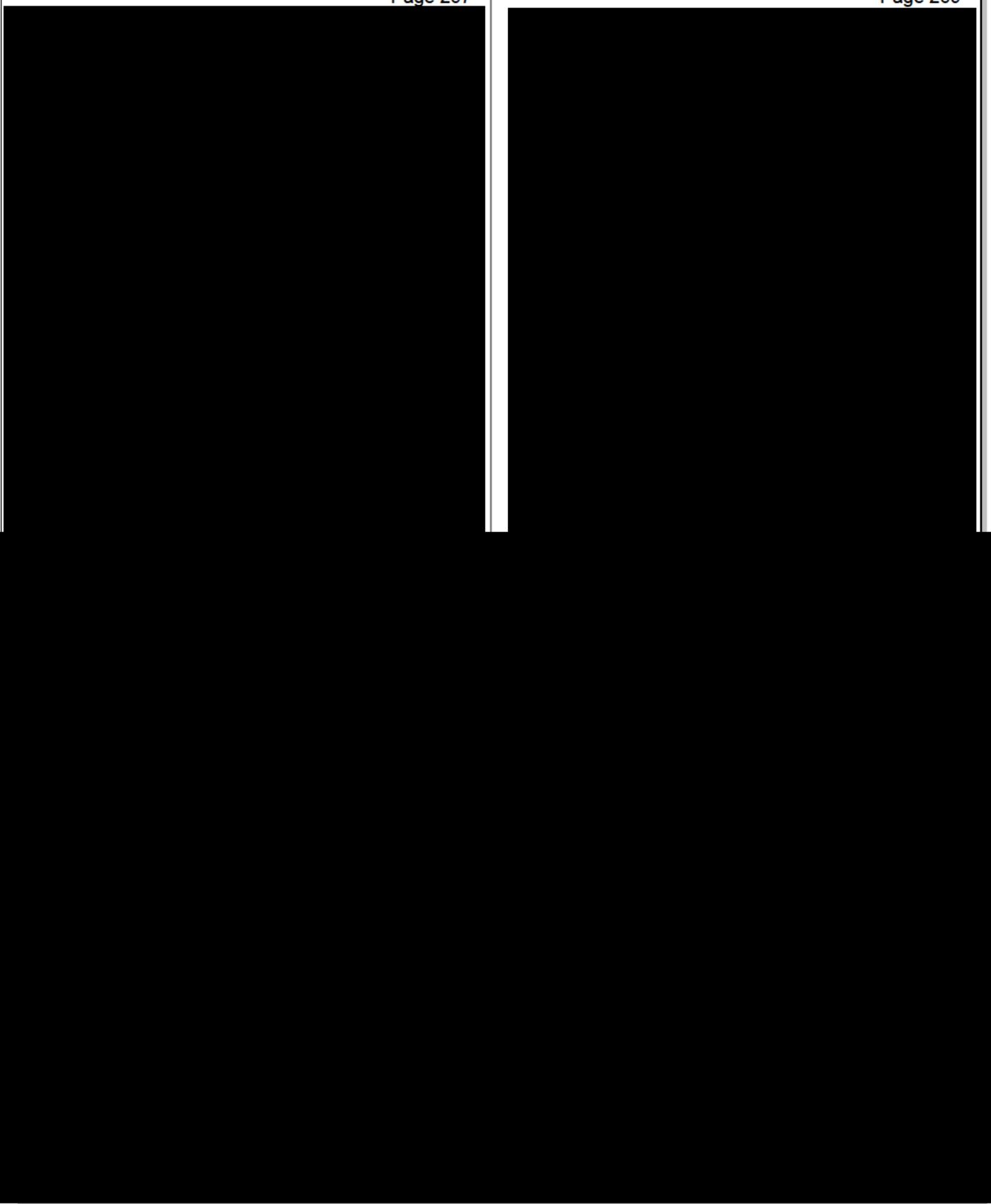
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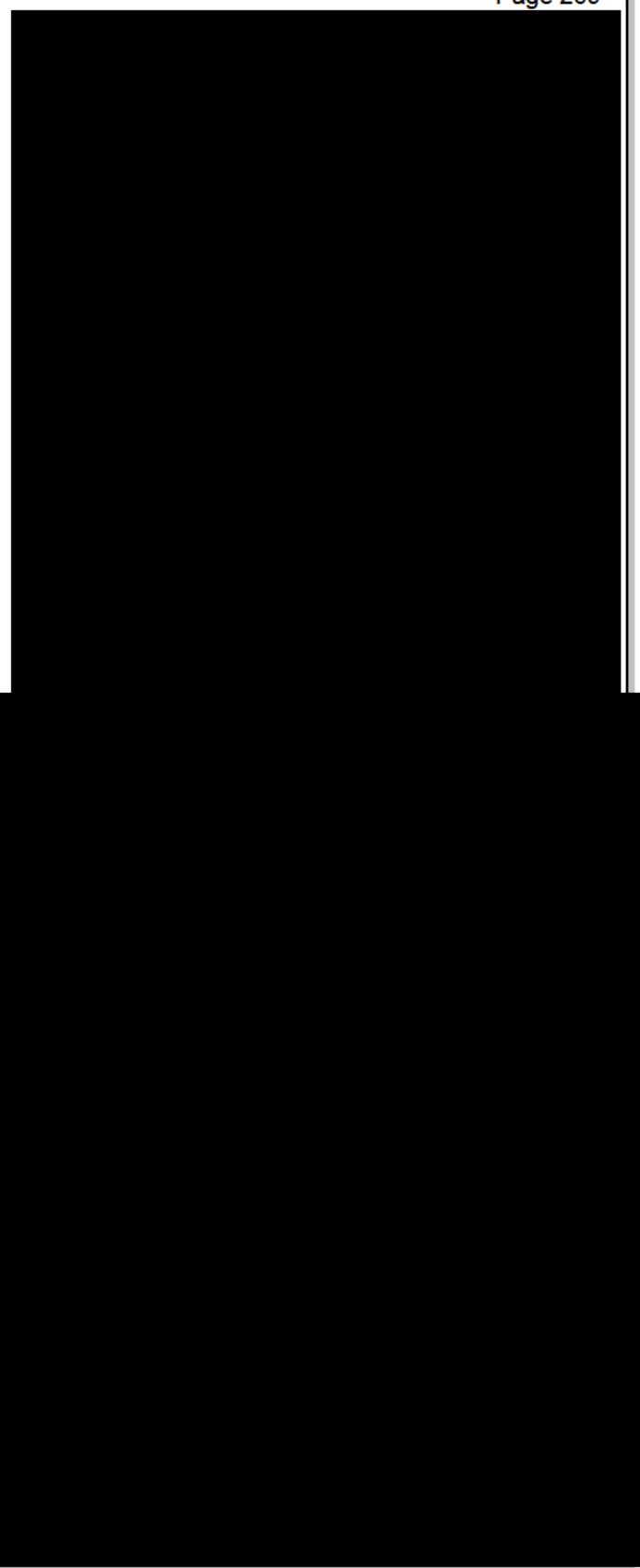
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	<p>1 he often keeps a Word document with vehicle history 2 in each vehicle's folder. So I would have to look 3 and see how he documented it.</p> <p>4 Q. Did you produce that material to 5 plaintiffs' counsel?</p> <p>6 A. I don't believe it was asked for.</p> <p>7 Q. Well, I believe it was. In any event, 8 we're asking for it now. Are you prepared to 9 testify that that one DTC was the only DTC that he 10 cleared?</p> <p>11 A. Correct.</p> <p>12 Q. Did you ask him that specifically?</p> <p>13 A. Max told me that was the only -- Max said 14 here's the DTC that is on the vehicle right now, 15 and I told him okay, don't do anything with it. 16 For some reason, he decided to do it. I mean, if I 17 had to be absolutely certain, I suppose I could go 18 ask him and say hey, are you absolutely certain 19 that it was the only one, but, you know, if there 20 was another code, he would have brought it up.</p> <p>21 Q. And during the entire time that the 22 vehicle was in your possession, were there other 23 DTCs that were cleared?</p> <p>24 A. No. The only time we ever saw a MIL 25 activated was on the dyno, which was further</p>
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<p>15 your engineer cleared in 2020 contrary to your 16 instructions. Do you remember testifying about 17 that?</p> <p>18 A. Yes.</p> <p>19 Q. Did either your engineer, Max Shank or you 20 document the DTCs that were present on the Cruze 21 before he cleared them?</p> <p>22 A. I believe he did. He documented that it 23 was the urea tank heater DTC.</p> <p>24 Q. How did he document that?</p> <p>25 A. He may have put it in an e-mail to me, or</p>	<p>1 indication that we felt those fault codes were 2 spurious.</p> <p>3 Q. And that was the NOx sensor alert that you 4 testified about yesterday?</p> <p>5 A. Correct.</p> <p>6 Q. And was that the only alert that you saw 7 on the dyno?</p> <p>8 A. Correct, and that alert was never seen on 9 the road.</p> <p>10 Q. Yesterday you made a brief reference to 11 the European Real Drive Emissions standard which 12 requires a PEMS testing. Do you remember that that 13 was in response to Ms. Smith's questioning?</p> <p>14 A. I do.</p> <p>15 Q. And you're familiar with the European RDE 16 legislation's concept of a conformity factor?</p> <p>17 A. Generally familiar with how they run their 18 RDE test, yes.</p> <p>19 Q. The conformity factors increase the 20 emissions standards for PEMS testing above the 21 standards for laboratory dyno testing, correct?</p> <p>22 A. Right.</p> <p>23 Q. And initially the conformity factor under 24 the European legislation was 2.1, correct?</p> <p>25 A. Okay.</p>

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<p>1 Q. You know that? You're familiar with that?</p> <p>2 A. I don't actually. I don't know about</p> <p>3 their conformity factors.</p> <p>4 Q. The conformity factor initially was 2.1,</p> <p>5 and that means that a car may emit 2.1 more times</p> <p>6 during a PEMS test as compared to a test under dyno</p> <p>7 lab conditions, correct?</p> <p>8 A. Correct, but you have to contextualize the</p> <p>9 European situation, which is they have vehicles of</p> <p>10 very large diesel population that are many factors</p> <p>11 above the standards and a much bigger NOx problem</p> <p>12 as a result than we have here in the U.S. I think</p> <p>13 they're further behind in the sophistication of</p> <p>14 their dynamometer cycles. Their dynamometer cycles</p> <p>15 don't cover nearly as much territory as we do here</p> <p>16 in the U.S.</p> <p>17 And so I believe that relatively high</p> <p>18 allowance per the conformity factor was a</p> <p>19 recognition of the fact that it's a completely</p> <p>20 different vehicle population with a completely</p> <p>21 different situation and completely different set of</p> <p>22 regulations.</p> <p>23 Q. Isn't it also a recognition of the fact</p> <p>24 that there are uncertainties in the PEMS testing</p> <p>25 system, and the reproducible conditions of the dyno</p>	<p>1 of the number coming out of the engine. And I</p> <p>2 reference the study that shows that.</p> <p>3 The uncertainty or variability, I think</p> <p>4 would be a better term, comes from how you run the</p> <p>5 test. So certainly if you run tests with higher</p> <p>6 aggressiveness or lower aggressiveness uphill,</p> <p>7 downhill, etcetera, those are going to produce more</p> <p>8 variability than in the dyno environment, which is</p> <p>9 always the same expect test with no hills, no</p> <p>10 changing conditions. So I believe if you run a</p> <p>11 dynamometer -- I'm sorry, a PEMS test over and over</p> <p>12 in the same types of conditions, you can</p> <p>13 demonstrate quite a high level of repeatability,</p> <p>14 and that's what we've done here.</p> <p>15 BY MR. BRODSKY:</p> <p>16 Q. All right. So the 2.1 compliance factor</p> <p>17 is attributable to the variability in PEMS testing</p> <p>18 as compared to dyno testing, correct?</p> <p>19 MR. WOJTANOWICZ: Object to the form.</p> <p>20 THE WITNESS: To be honest with you, I'm not</p> <p>21 that familiar with the basis of the conformity</p> <p>22 factor in Europe. I suspect it has something more</p> <p>23 to do with the more significant issues with</p> <p>24 emissions cheating that they have in Europe than we</p> <p>25 have here, and I don't -- I don't know and have not</p>
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<p>1 lab do not exist in PEMS tests?</p> <p>2 MR. WOJTANOWICZ: Object to the form.</p> <p>3 THE WITNESS: I don't believe that's the case</p> <p>4 at all. I believe PEMS testing is reproducible,</p> <p>5 and I don't believe PEMS testing has uncertainty.</p> <p>6 It's used by academics. It's used by regulatory</p> <p>7 agencies, and it's a very common and</p> <p>8 well-established piece of equipment. There are</p> <p>9 studies that show the accuracy of that equipment.</p> <p>10 I believe I referenced one of them in my paper.</p> <p>11 BY MR. BRODSKY:</p> <p>12 Q. So you're not aware that the European</p> <p>13 legislature or legislatures themselves have</p> <p>14 recognized the uncertainties in PEMS testing, and</p> <p>15 that's why -- one of the reasons why they</p> <p>16 introduced the concept of a conformity factor?</p> <p>17 MR. WOJTANOWICZ: Object to the form.</p> <p>18 THE WITNESS: So uncertainty in testing is a</p> <p>19 different -- so you have to parse this out into two</p> <p>20 pieces. So one is there an uncertainty in how</p> <p>21 the system measures the emission. Is the number</p> <p>22 you're getting from the tailpipe a true and</p> <p>23 accurate representation of the number that's coming</p> <p>24 out of the engine, and the answer to that is</p> <p>25 absolutely it's a true and accurate representation</p>	<p>1 researched the background of the basis of the</p> <p>2 conformity factor. I can only go back and cite</p> <p>3 studies which I think are more relevant than the</p> <p>4 opinion of the European legislature that shows</p> <p>5 there is a good correlation between PEMS</p> <p>6 measurements and dynamometer measurements, and one</p> <p>7 of those studies is in my report.</p> <p>8 BY MR. BRODSKY:</p> <p>9 Q. Which study is that?</p> <p>10 A. Footnote 30, On-Road and Chassis</p> <p>11 Dynamometer Evaluations of Emissions from Two Euro</p> <p>12 6 Diesel Vehicles, SAE 2014 01-2826. It shows</p> <p>13 10 percent agreement between PEMS and the chassis</p> <p>14 dynamometer. I should also note that, again, PEMS</p> <p>15 is used in the end use compliance program in the</p> <p>16 United States, and it's also used by regulators</p> <p>17 extensively and that GM itself used PEMS data to</p> <p>18 present to Air Resources Board.</p> <p>19 Q. Mr. Smithers, you cited a number of</p> <p>20 articles in your report, did you not?</p> <p>21 A. I did.</p> <p>22 Q. And one of them was cited at Page 27,</p> <p>23 footnote 31, the Weiss, et al. article?</p> <p>24 A. Okay.</p> <p>25 Q. Let's mark that as an exhibit. It's tab</p>

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<p>1 16 in your -- it should be separately reproduced in 2 your box. This is one of the articles that you 3 relied on and cited? 4 MR. WOJTANOWICZ: David, can you hold on one 5 second? It's just now coming up. 6 MR. BRODSKY: Yep. 7 MR. WOJTANOWICZ: Okay. I've got it. Thank 8 you. 9 BY MR. BRODSKY: 10 Q. Mr. Smithers, this is one of the articles 11 that you cited and relied upon? One of the studies 12 I should say. 13 A. For the RPA calculation, yes. 14 Q. Turn to Page 45, please. Toward the 15 bottom, the authors write the following: On-road 16 emissions testing with PEMS allows covering a large 17 variety of driving conditions and is typically 18 characterized by a high degree of randomness and 19 limited repeatability. The variability in road, 20 weather and traffic conditions as well as the 21 driver's behavior attribute to every on-road PEMS 22 test quasi-unique characteristics. Do you see 23 that? 24 A. I do. 25 Q. Did I read that correctly?</p>	<p>1 were done by Mr. Shank and Mr. Carson? 2 A. Yeah. 3 Q. And they're both employees of your firm? 4 A. They are. 5 Q. Do they have any training on the 6 conducting of test drives? 7 A. Training by me, yes. 8 Q. How did you train them? 9 A. I asked them to drive within a certain 10 parameter of speed and acceleration and looked at 11 the data afterward to ensure that they drove within 12 those parameters, and they did. 13 Q. So was that training independent of the 14 PEMS testing you did? 15 A. The instruction to them was here are the 16 average speeds and the types of accelerations we 17 are trying to hit and go out with the PEMS testing 18 and run the tests, and let's analyze the speeds and 19 RPAs that you hit based upon my instructions. And 20 they were able to rather easily meet the criteria 21 of the tests that I laid out for them, which were 22 driving -- city driving with an attempt to get 20 23 to 25 miles an hour average speed. 24 That was something they were able to do 25 just as experienced drivers. I don't think there's</p>
<p>1 A. You did. 2 Q. You can put that aside. 3 A. Well, I'd like to comment on that. So -- 4 Q. Well, you don't get to comment on it. You 5 get to answer my questions, sir, and I'm going to 6 have another question for you. 7 A. The repeatability -- 8 Q. Sir -- sir, just wait for my next 9 question, please. 10 A. Okay. 11 Q. Did you do any of the PEMS test drives 12 yourself? 13 A. I did not. 14 Q. You used drivers to do the tests? 15 A. Engineers. 16 Q. And how many different engineers did you 17 use? 18 A. Three. 19 Q. Who were they? 20 A. Max Shank, Thomas Carson and -- yeah, and 21 then Bill Rimkus in this case. 22 Q. I think we established that Bill Rimkus 23 did the PEMS test in 2016; is that correct? 24 A. Yeah. 25 Q. So all the PEMS testing in 2018 and '19</p>	<p>1 any particular unique qualification that's required 2 to drive a car, especially for someone that's been 3 driving for many years. And then there were 4 instructions to maintain at a highway speed 5 60 miles an hour steady with soft accelerations if 6 they were required. And that data was all 7 presented, and the drive parameters were certainly 8 within my expectations. 9 Q. Prior to them doing the actual PEMS 10 testing, did they receive any training on how to 11 conduct these tests? 12 A. They received training on how to operate 13 the PEMS equipment. 14 Q. Did they receive any training on how to 15 drive the cars prior to actually doing the driving 16 on the PEMS test? 17 A. As I mentioned, I don't believe any 18 special training is required for an experienced 19 driver. The instructions were maintain these 20 average speeds, accelerate softly, and we'll check 21 the data and see if you're able to hit those 22 targets, and they were. And I believe that's 23 sufficient training. 24 Q. So the answer to my question is no, they 25 didn't -- prior to doing the tests, they did not</p>

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<p>1 receive any training in conducting PEMS tests?</p> <p>2 A. No.</p> <p>3 MR. WOJTANOWICZ: Object to the form. Asked</p> <p>4 and answered.</p> <p>5 THE WITNESS: The answer to your question is</p> <p>6 not no, they didn't receive any training in</p> <p>7 conducting PEMS tests. They received training in</p> <p>8 the PEMS equipment, and they are trained drivers.</p> <p>9 Those are the qualifications for someone to run a</p> <p>10 PEMS test.</p> <p>11 BY MR. BRODSKY:</p> <p>12 Q. They're trained drivers did you say? How</p> <p>13 are they trained drivers?</p> <p>14 A. You didn't go through driver's training</p> <p>15 when you learned to drive a car?</p> <p>16 Q. Is that the training that they had, their</p> <p>17 high school driver's ed class? That's the training</p> <p>18 you're referring to when you say they're trained</p> <p>19 drivers?</p> <p>20 A. And over 10 years of experience on the</p> <p>21 road with a clean driving record. We're not --</p> <p>22 we're not -- we're not talking about a</p> <p>23 sophisticated and difficult operation. You're</p> <p>24 simply trying to hit a certain target set of speeds</p> <p>25 and a certain set of target accelerations. And if</p>	<p>1 Q. Prior to running these tests, did any of</p> <p>2 these people work for any other testing firms?</p> <p>3 A. Bill Rimkus runs his own testing firms.</p> <p>4 He's been running catalyst testing for a good</p> <p>5 portion of his career using gas analyzers very</p> <p>6 similar to what's in the PEMS system. I'm less</p> <p>7 familiar with Thomas Shank's background, although</p> <p>8 he's done -- he's worked with a wide variety of</p> <p>9 measurement equipment as any engineer would.</p> <p>10 Q. I think you just confused the two. You</p> <p>11 said Thomas Shank.</p> <p>12 A. Sorry, Thomas Carson. And then Max Shank</p> <p>13 has worked with a huge variety of measurement</p> <p>14 equipments, and of course, understand that they did</p> <p>15 receive formal training from the manufacturer who</p> <p>16 flew out and trained them on the system. And given</p> <p>17 their backgrounds and their capabilities, the use</p> <p>18 of this equipment was not much of a stretch from</p> <p>19 what they've done for many years.</p> <p>20 Q. How long has Mr. Shank worked for you?</p> <p>21 A. Two to three years.</p> <p>22 Q. And where did he work before working for</p> <p>23 you?</p> <p>24 A. I don't recall the name of the firm.</p> <p>25 Q. How about Mr. Carson, how long has he</p>
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<p>1 you can do that, then you're qualified to do that.</p> <p>2 That is not difficult for a driver.</p> <p>3 Q. Okay. Did they ever do PEMS tests before</p> <p>4 this?</p> <p>5 A. Each of them has worked extensively with</p> <p>6 gas analyzers that are very similar to PEMS gas</p> <p>7 analyzers. And so to use a PEMS system was really</p> <p>8 just a simple application that they had been doing</p> <p>9 for many years.</p> <p>10 Q. That's interesting, but maybe you can</p> <p>11 answer my question. Did they ever do a PEMS test</p> <p>12 before this; yes or no?</p> <p>13 MR. WOJTANOWICZ: Object to the form.</p> <p>14 THE WITNESS: I don't recall the sequence of</p> <p>15 who worked on vehicles before the Cruze, so I -- I</p> <p>16 don't recall.</p> <p>17 BY MR. BRODSKY:</p> <p>18 Q. You referred to Mr. Shank and Mr. Carson</p> <p>19 as engineers. What kind of engineering training do</p> <p>20 they have or engineering background?</p> <p>21 A. Thomas Carson has a chemical engineering</p> <p>22 degree, and I believe Max Shank has an</p> <p>23 environmental science degree with a lot of</p> <p>24 specialty in test measurement equipment, and Bill</p> <p>25 Rimkus has a master's in mechanical engineering.</p>	<p>1 worked for you?</p> <p>2 A. Same, about a couple years.</p> <p>3 Q. And what did he do before?</p> <p>4 A. I'd have to look at his resumé. I don't</p> <p>5 recall.</p> <p>6 Q. Okay. The drives themselves just had the</p> <p>7 driver in the car. There was no passenger,</p> <p>8 correct?</p> <p>9 A. Correct.</p> <p>10 Q. And as I understand it, there was no</p> <p>11 written protocol for how the drives were to be</p> <p>12 conducted; is that right?</p> <p>13 A. There is a written protocol for how we run</p> <p>14 the test, but the drives themselves, I told them</p> <p>15 how I wanted them to drive. And looking through</p> <p>16 the data, they were able to easily match the</p> <p>17 requirements of what I wanted them to do.</p> <p>18 Q. Was there a written protocol for how the</p> <p>19 drives were to be conducted?</p> <p>20 MR. WOJTANOWICZ: Object to the form. Asked</p> <p>21 and answered.</p> <p>22 THE WITNESS: I believe I answered the</p> <p>23 question.</p> <p>24 BY MR. BRODSKY:</p> <p>25 Q. You didn't. Was there a written protocol</p>

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<p>1 for how the drives are to be conducted?</p> <p>2 A. I believe I answered the question.</p> <p>3 MR. WOJTANOWICZ: Objection.</p> <p>4 BY MR. BRODSKY:</p> <p>5 Q. Sir, was there a written protocol for how</p> <p>6 the drives are to be conducted; yes or no? It's a</p> <p>7 simple question.</p> <p>8 MR. WOJTANOWICZ: Objection. Asked and</p> <p>9 answered. Juston, you can answer if you're able.</p> <p>10 THE WITNESS: As I did, there's a written</p> <p>11 protocol for how the PEMS equipment is supposed to</p> <p>12 be used in each of the tests, but my instructions</p> <p>13 for how to drive the vehicle were verbal.</p> <p>14 BY MR. BRODSKY:</p> <p>15 Q. There was nothing in writing telling the</p> <p>16 drivers where to drive, was there?</p> <p>17 A. No. We -- we did not concern ourselves</p> <p>18 much with the specific route. What we wanted to</p> <p>19 hit was certain route types, so flat roads, hilly</p> <p>20 roads, hot temperatures, low temperatures, and the</p> <p>21 data show that they were able to do that with a</p> <p>22 high degree of accuracy. So the fact that, you</p> <p>23 know, they didn't receive written instructions,</p> <p>24 they appear to have taken the verbal instructions</p> <p>25 and were able to nail exactly what I was looking</p>	<p>1 Q. Sir, just answer my question. Did you</p> <p>2 take notes of the oral instructions?</p> <p>3 MR. WOJTANOWICZ: David, I'm going to ask you</p> <p>4 to stop badgering the witness, please. You don't</p> <p>5 need to berate him or yell at him. You can ask him</p> <p>6 civil questions. That's the way this deposition</p> <p>7 should go, okay?</p> <p>8 MR. BRODSKY: Yes, and he should be responsive</p> <p>9 to the questions rather than giving speeches.</p> <p>10 BY MR. BRODSKY:</p> <p>11 Q. It's a simple question. Did you take</p> <p>12 notes of the instructions that you gave the</p> <p>13 drivers?</p> <p>14 A. I did not.</p> <p>15 Q. Okay. Thank you.</p> <p>16 A. I just wanted to make a clarification that</p> <p>17 the actual test results are a written record of</p> <p>18 the -- of the test. I mean, there's no more</p> <p>19 accurate record of what was done in the test than</p> <p>20 the actual test results themselves.</p> <p>21 Q. I'm asking about the instructions given,</p> <p>22 not the results obtained. You understand there's a</p> <p>23 difference between those two things, don't you?</p> <p>24 A. I'm trying to answer your questions as</p> <p>25 thoroughly as I can. I apologize.</p>
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<p>1 for. So I don't think the absence of written</p> <p>2 instructions was an issue.</p> <p>3 Q. When you gave the oral instructions to</p> <p>4 these two men, did you do it each time they went</p> <p>5 out on a test drive?</p> <p>6 A. No. They have a general sense of what</p> <p>7 we're looking for in the data, and, you know, a</p> <p>8 certain number of miles and certain conditions that</p> <p>9 they want to hit, and they would follow those on</p> <p>10 their own. Then I would often analyze data and say</p> <p>11 hey, I want to take a look at this area a little</p> <p>12 bit more. Can you give me more driving of this</p> <p>13 style in these ambient conditions so I can see</p> <p>14 what's going on here?</p> <p>15 Q. And is there any written record whatsoever</p> <p>16 of the oral instructions that you gave the drivers?</p> <p>17 A. There doesn't need to be because there's a</p> <p>18 record of what they actually did on the drive,</p> <p>19 which is the important metric. So no, there's no</p> <p>20 written oral record because it was an oral</p> <p>21 instruction, so there wouldn't be any written</p> <p>22 record.</p> <p>23 Q. Well, there could be notes that you took.</p> <p>24 Did you take any notes?</p> <p>25 A. But there's a --</p>	<p>1 Q. Now, did you do any research on what</p> <p>2 typical driving patterns look like in the United</p> <p>3 States?</p> <p>4 A. No. The goal of the test was to try and</p> <p>5 simulate the patterns of the FTP-75 and the</p> <p>6 patterns of the highway fuel economy test within</p> <p>7 reason so that we could compare the PEMS results to</p> <p>8 those tests. Bear in mind that those -- those</p> <p>9 tests themselves are derived from studies of</p> <p>10 driving patterns in the United States, and that's</p> <p>11 referenced in my report.</p> <p>12 Q. So your goal was to simulate the driving</p> <p>13 patterns of the FTP-75 and the highway fuel economy</p> <p>14 test, correct?</p> <p>15 A. The goal was to drive in a manner that was</p> <p>16 reflective of those two cycles.</p> <p>17 Q. You did not select your test routes based</p> <p>18 on whether they're consistent with typical driving</p> <p>19 patterns, correct?</p> <p>20 MR. WOJTANOWICZ: Object to the form.</p> <p>21 THE WITNESS: In many ways they're one in the</p> <p>22 same. I mean, it was somewhat fortuitous that</p> <p>23 driving around in the local urban area tended to</p> <p>24 yield a driving pattern that was very similar to</p> <p>25 the FTP-75, and I suppose that is no surprise</p>

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<p>1 because the FTP-75 itself was derived from 2 real-world data. 3 BY MR. BRODSKY: 4 Q. But other than seeking to replicate or 5 simulate the FTP-75 and highway fuel economy test, 6 you did nothing to try to study what typical 7 driving routes or driving patterns are in the U.S., 8 correct?</p> <div style="background-color: black; height: 150px; width: 100%; margin-top: 10px;"></div> <p>21 Q. 22 was made to drive the vehicles with conservative 23 soft accelerations, correct? 24 A. Correct. 25 Q. And you weren't in the car monitoring the accelerations, right?</p>	<p>1 entire test drive, correct? 2 A. Right. 3 Q. The calculation does not lead to a value 4 about how aggressive the driver was during any 5 given moment of the test drive, correct? 6 A. Right. 7 Q. And the calculation doesn't tell you how 8 often during the test drive a driver might have 9 been aggressive, correct? 10 A. Well, it does because it's an average. So 11 it does give you some information. If it's driven 12 aggressively often, then the average will be high. 13 Q. Correct, but it doesn't tell you how often 14 during a test drive the driver might have been 15 aggressive because it's just giving you an average 16 of the entire drive, correct? 17 A. No. 18 MR. WOJTANOWICZ: Object to the form. 19 THE WITNESS: We use RPA consistent with how 20 it's been used by other researchers. 21 BY MR. BRODSKY: 22 Q. That's not what I asked. I'm asking about 23 the way RPA is measured because it's an average of 24 an entire trip. It doesn't tell you how often 25 during that trip the driver might have been</p>
<p>1 A. I don't need to be. I have the data 2 afterward. 3 Q. You made this point in your report because 4 aggressive accelerations can materially increase 5 NOx tailpipe emissions, correct? 6 A. Right. 7 Q. And you claim that you conducted the tests 8 with careful control over driving aggressiveness, 9 correct? 10 A. Right. 11 Q. And the way you back up that claim is with 12 an after-the-fact calculation using something 13 called relative positive acceleration or RPA, 14 correct? 15 A. Right. 16 Q. And that RPA is a formula that takes speed 17 times acceleration for each second of the drive and 18 divides by the mile driven? 19 A. It's been a while since I've done the 20 calc, but yeah, the general idea is to characterize 21 the acceleration over a period of time. 22 Q. Okay. And it gives you an average measure 23 across a given test trip, correct? 24 A. Correct. 25 Q. So it leads to a single value for the</p>	<p>1 aggressive; isn't that right? 2 MR. WOJTANOWICZ: Object to the form. 3 THE WITNESS: It doesn't, however, my drivers 4 were instructed very carefully not to be aggressive 5 in their driving, and the traces are all presented, 6 the driving traces in the PowerPoint presentations 7 that defendants received, and I don't believe any 8 of them demonstrate any kind of aggressive driving. 9 So while yes, those numbers could have some 10 aggressive driving in them, a careful review of the 11 driving traces shows that that was not the case. 12 Every conceivable effort was made to not 13 drive aggressively, and the drivers were very 14 carefully instructed not to drive aggressively to 15 keep the results conservatively low. So while yes, 16 it is true that you could have a low average number 17 that has periodic spikes that are high, if you 18 wanted to review the data to look at those spikes, 19 I think you would find in the data that there 20 weren't any. 21 BY MR. BRODSKY: 22 Q. Have you done that? 23 A. I did that when I went through each of the 24 data files. So I can see -- in those PowerPoints, 25 you can see the vehicle trace through the entire</p>

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<p>1 segment of each segment that I analyze, and if I 2 saw an aggressive acceleration, I would flag it. 3 Q. Okay. So RPA isn't the only available 4 metric for evaluating aggressiveness in a test 5 drive, correct? 6 A. I suppose there are other ways you could 7 look at it, but that's an accepted methodology that 8 was accepted by West Virginia University. It's 9 also the accepted methodology for the Real Driving 10 Emissions test parameters in Europe. 11 Q. Well, actually Europe has another metric 12 that's relied upon; isn't that correct? 13 A. Right. 14 Q. What's it called? 15 A. It's the multiple of speed and RPA. 16 Q. It's referred to as $v^*a(pos)$ at 95, isn't 17 it? 18 A. It is, and in fact, if you look at the 19 plots of RPA, this is essentially what they're 20 looking at. You're looking at the RPA at different 21 speeds. So that number $v^*a(pos)$ yields the same 22 results of this plot, which is over a range of 23 speeds. The range of RPAs is about the same as 24 what you see, for example, in this plot, the 25 FTP-75.</p>	<p>1 Q. And $v^*a(pos)$ at 95 allows you to compare 2 the aggressiveness during the same part of two 3 different test drives along the same route, right? 4 A. Right, as does this plot. 5 Q. And finally, $v^*a(pos)$ at 95 allows you to 6 assess whether aggressiveness at a given point of 7 time correlates to an emissions spike at that same 8 point in time, correct? 9 A. Yes, as does this plot. 10 Q. So I take it you didn't calculate $v^*a(pos)$ 11 at 95 for your various test drives; is that right? 12 A. No. We followed West Virginia 13 University's methodology, which was to look at 14 RPA -- 15 Q. You have the data -- 16 A. -- but we looked at RPA over various 17 speeds, which is what you see in Figure 8-2 and 18 Figure 8-3. 19 Q. Okay, but you did have the data that would 20 have allowed you to calculate $v^*a(pos)$ at 95 if you 21 wished to? 22 A. We do. 23 Q. Now, it's true, is it not, that the 24 emissions measured by PEMS equipment can vary from 25 one drive to the next even involving the same</p>
<p style="text-align: center;">Page 296</p> <p>1 So it does -- our methodology does 2 consider the speed and the RPA in the same way that 3 the RDE regulation considers the multiple. It's 4 just two ways of looking at the same thing. 5 Q. Let's -- let's get some of this on the 6 record. So $v^*a(pos)$ at 95 calculates 7 aggressiveness using the 95th percentile speed of 8 positive acceleration for each second within a test 9 drive, correct? 10 A. My understanding of $v^*a(pos)$ is that it's 11 the multiple of RPA and speed for a given time. 12 Q. Well, it doesn't calculate the way RPA 13 does. It doesn't calculate an average across the 14 entirety of the drive, correct? 15 A. It's instantaneous. 16 Q. So it allows you to analyze aggressiveness 17 at any given point in time during the drive, 18 correct? 19 A. It does the same way that this plot that I 20 have here also does the same. 21 Q. Okay. And $v^*a(pos)$ at 95 allows you to 22 identify if a driver was very aggressive in some 23 parts of a drive, but less aggressive in other 24 parts, correct? 25 A. As does this plot.</p>	<p style="text-align: center;">Page 298</p> <p>1 vehicle? 2 A. Just as with a dynamometer, yes. 3 Q. And emissions measured by PEMS equipment 4 can be affected by many different variables, 5 correct? 6 A. Just like a dynamometer, yes. 7 Q. So I just want you to confirm that these 8 are among the variables that can affect the outcome 9 of a PEMS test, the grade of the road? 10 A. Yes. Yes. 11 Q. The condition of the road surface, yes? 12 A. To an extent. 13 Q. How much the road curves, can that have an 14 effect on the PEMS result? 15 A. To a very minor extent. 16 Q. Weather conditions can affect the PEMS 17 test, correct? 18 A. To the extent that they change the way the 19 vehicle is behaving, certainly. 20 Q. Right. So if it's very windy, that can 21 have an effect, correct? 22 A. Right. 23 Q. Ambient temperature at the time of the 24 test, that can have an effect? 25 A. Yes.</p>

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<p>1 Q. Barometric pressure can have an effect?</p> <p>2 A. At a given elevation, the changes in</p> <p>3 barometric pressure are fairly negligible, but if</p> <p>4 you're talking about bariatic pressure as a result</p> <p>5 of going to a high elevation, I suppose that can</p> <p>6 modify it.</p> <p>7 Q. Yes. Whether it's sunny or rainy could</p> <p>8 have an effect, correct?</p> <p>9 A. On the emissions results?</p> <p>10 Q. Yes.</p> <p>11 A. Very small. I'm not sure what the effect</p> <p>12 would be.</p> <p>13 Q. How about traffic conditions, that can</p> <p>14 have an effect, correct?</p> <p>15 A. Certainly.</p> <p>16 Q. And I think we've already established that</p> <p>17 the driver's behavior, driving style can have a</p> <p>18 major effect on the PEMS result?</p> <p>19 A. Right.</p> <p>20 MR. WOJTANOWICZ: Object to the form.</p> <p>21 BY MR. BRODSKY:</p> <p>22 Q. So all of the conditions that we've just</p> <p>23 talked about cannot be exactly replicated from one</p> <p>24 drive to another; isn't that true?</p> <p>25 A. And that's the reason we conduct so many</p>	<p>1 and we ran several of those tests.</p> <p>2 Q. Did you perform a dyno test using your</p> <p>3 PEMS equipment to verify the reliability of its</p> <p>4 results?</p> <p>5 A. We did not.</p> <p>6 Q. Some of the articles that you cited and</p> <p>7 relied upon, the studies, I should say, that you</p> <p>8 cited and relied upon, did exactly that, correct?</p> <p>9 A. I'm not sure what --</p> <p>10 Q. Look at --</p> <p>11 A. There's a study that I referenced before.</p> <p>12 Q. Yeah. If you look at tab 14, which is one</p> <p>13 of the studies that you cite in your report and</p> <p>14 turn to Page 2.</p> <p>15 A. Okay.</p> <p>16 Q. Do you see under work scope? It's the</p> <p>17 second bullet point. The authors write following</p> <p>18 PEMS-manufactured supported installation of their</p> <p>19 system on the SCR vehicle, a correlation between</p> <p>20 the on-board and the lab-based emissions</p> <p>21 measurement systems was undertaken.</p> <p>22 Did I read that correctly?</p> <p>23 A. Where are you in the document?</p> <p>24 Q. I'm on Page 2. The heading is work scope,</p> <p>25 and I just read the second bullet point.</p>
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<p>1 tests in very similar conditions so that we can</p> <p>2 show repeatability so we don't rely on any one test</p> <p>3 in any given condition. We do dozens of tests in</p> <p>4 the same condition to approach an average of an</p> <p>5 answer. So that's how we deal with variability.</p> <p>6 Q. Right. I understand that's how you deal</p> <p>7 with it. I was just asking you to confirm that</p> <p>8 there are -- there is variability because of all</p> <p>9 these parameters that can't be repeated from one</p> <p>10 drive to another, and that's a true statement,</p> <p>11 correct?</p> <p>12 MR. WOJTANOWICZ: Object to the form.</p> <p>13 THE WITNESS: There is varying degrees of</p> <p>14 variability. Some of the parameters that you</p> <p>15 mentioned would have a negligible effect, and some</p> <p>16 of them could have some effect. It really depends</p> <p>17 on the situation.</p> <p>18 BY MR. BRODSKY:</p> <p>19 Q. Did you repeat any of your tests using the</p> <p>20 same conditions? Did you try to replicate your</p> <p>21 tests using the same conditions?</p> <p>22 A. Absolutely, but we define same conditions</p> <p>23 as, say, for example, vehicles on a flat road</p> <p>24 traveling at 60 miles an hour with an ambient</p> <p>25 temperature between 75 and 85 degrees Fahrenheit,</p>	<p>1 A. Okay. Yeah.</p> <p>2 Q. And then further on in the study on</p> <p>3 Page 7, they go through the details of that</p> <p>4 correlation test, correct?</p> <p>5 A. Yes.</p> <p>6 Q. So the people that ran this study used a</p> <p>7 dynamometer to verify the accuracy and reliability</p> <p>8 of their PEMS equipment, correct?</p> <p>9 A. Okay.</p> <p>10 Q. Is that true?</p> <p>11 A. It would appear so. I believe they were</p> <p>12 doing a comparison between the two.</p> <p>13 Q. And if you look at tab 15, which is the</p> <p>14 West Virginia study that you've referenced several</p> <p>15 times, and I'm going to ask you about Page 50.</p> <p>16 A. Uh-huh.</p> <p>17 Q. And you see --</p> <p>18 MR. WOJTANOWICZ: Can you hold on one second</p> <p>19 please, David? The exhibit is just getting up.</p> <p>20 MR. BRODSKY: Yeah. Just let me know.</p> <p>21 MR. WOJTANOWICZ: Okay. You said you're on</p> <p>22 Page 50?</p> <p>23 MR. BRODSKY: Yes.</p> <p>24 MR. WOJTANOWICZ: Okay. Thank you.</p> <p>25</p>

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<p>1 BY MR. BRODSKY:</p> <p>2 Q. There the -- there were three vehicles</p> <p>3 tested, and they took one of those vehicles and</p> <p>4 hooked up their PEMS equipment to it, ran the PEMS</p> <p>5 equipment on a dyno and compared the results to the</p> <p>6 dyno results to verify the accuracy of their PEMS</p> <p>7 equipment, correct?</p> <p>8 A. It looks like it.</p> <p>9 Q. Were there any issues with your PEMS</p> <p>10 equipment during the testing other than you talked</p> <p>11 about the condensation issue, but then you said you</p> <p>12 didn't think that dealt with the Cruze. So</p> <p>13 focusing on the PEMS equipment that you used during</p> <p>14 the testing on the Cruze, were there any issues</p> <p>15 that arose during your testing?</p> <p>16 A. Other than normal maintenance, no.</p> <p>17 Q. If the PEMS weather probe measured above</p> <p>18 60 degrees centigrade at any point, would you</p> <p>19 question that temperature result?</p> <p>20 A. If the PEMS weather probe was well above</p> <p>21 what I believe to be the ambient temperature at the</p> <p>22 time, I would.</p> <p>23 Q. And did that ever happen?</p> <p>24 A. Not that I'm aware of.</p> <p>25 Q. Did your team monitor for diagnostic</p>	<p>1 for the MIL to come on if there's an indication of</p> <p>2 any other issue.</p> <p>3 Q. And again, the one time that you checked</p> <p>4 for fault codes was when?</p> <p>5 A. We checked for fault codes when we</p> <p>6 received the vehicle and then again when the MIL</p> <p>7 came on during the time of the dyno testing and</p> <p>8 then when the MIL came on for the fault right</p> <p>9 before the inspection.</p> <p>10 Q. Okay. And yesterday you referred to some</p> <p>11 time zone or time signature problems on the</p> <p>12 equipment. Did you record the actual time of the</p> <p>13 PEMS tests at all given that the time signature</p> <p>14 wasn't right? Is there some way?</p> <p>15 A. If we cared about the exact time that the</p> <p>16 test started, which I haven't found a reason to use</p> <p>17 it yet, we could figure out what the offset is and</p> <p>18 manually change all of those date entries. We know</p> <p>19 what the offset is, but the time --</p> <p>20 Q. What is the offset?</p> <p>21 A. I'd have to go back and ask the</p> <p>22 manufacturer what the offset is, but those numbers</p> <p>23 could be adjusted if we wanted to. I haven't found</p> <p>24 a reason to care too much about the time that the</p> <p>25 test started.</p>
<p>Page 304</p>	<p>Page 306</p>
<p>1 trouble codes during the PEMS testing?</p> <p>2 A. They monitored for a malfunction indicator</p> <p>3 lamp, the check engine light coming on.</p> <p>4 Q. Okay. I think I asked you this yesterday,</p> <p>5 but if I did, I apologize. You know that DTC codes</p> <p>6 can come on even without the MIL light lighting up,</p> <p>7 correct?</p> <p>8 A. I think our assumption, which, I believe,</p> <p>9 I hope, was a reasonable engineering assumption is</p> <p>10 is that, you know, this car is designed to meet the</p> <p>11 emissions standards up to 150,000 miles. We</p> <p>12 followed practices very similar to what, for</p> <p>13 example, is in the Code of Federal Regulations for</p> <p>14 in-use testing where they simply require</p> <p>15 manufacturers to ensure that maintenance was</p> <p>16 performed and that one scan of the OBD is run</p> <p>17 before the test is run.</p> <p>18 I think the notion that the vehicle's</p> <p>19 emission control systems are so frail that they</p> <p>20 need to be constantly checked over the period of an</p> <p>21 8,000-mile test when the car is only 16,000 miles</p> <p>22 old, in our engineering judgment, just seemed</p> <p>23 unusual and unlikely. So we felt it was sufficient</p> <p>24 and perfectly justifiable in our engineering</p> <p>25 experience to check for fault codes once and wait</p>	<p>1 Q. So other than applying some offset that</p> <p>2 you're given from the manufacturer, you don't have</p> <p>3 any other independent record of the time that the</p> <p>4 tests were conducted?</p> <p>5 A. Good question. I don't think so, but</p> <p>6 again, those times can be adjusted, and we have the</p> <p>7 record.</p> <p>8 MR. WOJTANOWICZ: David, we've been going for</p> <p>9 about an hour. Can we take a short break, please?</p> <p>10 MR. BRODSKY: Absolutely. How long do you</p> <p>11 need?</p> <p>12 MR. WOJTANOWICZ: I think five minutes would be</p> <p>13 good.</p> <p>14 MR. BRODSKY: Okay.</p> <p>15 THE VIDEOGRAPHER: Going off the video record.</p> <p>16 The time is now 17:03 UTC.</p> <p>17 (Whereupon, a short break was</p> <p>18 taken.)</p> <p>19 THE VIDEOGRAPHER: We are back on the video</p> <p>20 record. The time is now 17:11 UTC. Go ahead.</p> <p>21 BY MR. BRODSKY:</p> <p>22 Q. Mr. Smithers, yesterday there was some</p> <p>23 testimony about the placement of your temperature</p> <p>24 probe and how relevant the temperature readings</p> <p>25 were given that placement. Do you remember that --</p>

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15 (Pages 307 to 310)

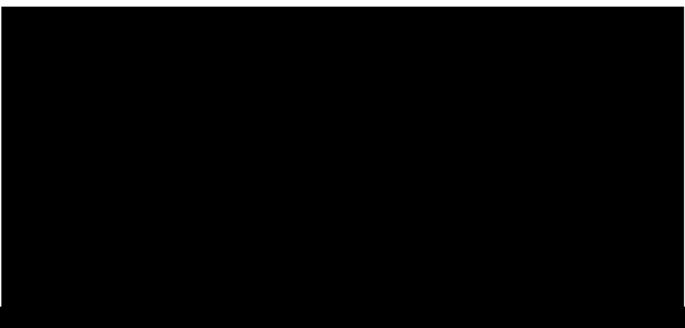
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<p>1 A. I do.</p> <p>2 Q. -- discussion?</p> <p>3 Did you account for any potential</p> <p>4 differences between the ambient air temperature at</p> <p>5 the height of your probe and the ambient air</p> <p>6 temperature at the height of the intake grill?</p> <p>7 A. No, because the goal -- as I stated</p> <p>8 yesterday, the goal of the environmental</p> <p>9 temperature is to try to capture the true</p> <p>10 environmental temperature, and far away from the</p> <p>11 road is the place you would want to do that.</p> <p>12 Q. And just a couple of follow-ups from the</p> <p>13 testimony that you gave earlier today about</p> <p>14 conditions of PEMS testing. Did you document</p> <p>15 whether any given PEMS test was conducted in sunny</p> <p>16 conditions?</p> <p>17 A. Generally speaking, we did not.</p> <p>18 Q. Did you document whether any given PEMS</p> <p>19 test was conducted in cloudy conditions?</p> <p>20 A. No. We looked at the temperature alone.</p> <p>21 Q. And you didn't document whether any given</p> <p>22 PEMS test was conducted in windy conditions, did</p> <p>23 you?</p> <p>24 A. No.</p> <p>25 Q. And did you account for any potential</p>	<p>1 Exhibit 23. It's the list of your PEMS testing</p> <p>2 files.</p> <p>3 A. Okay.</p> <p>4 Q. So there are 60 data files here, and from</p> <p>5 those 60 data files, you generated 681 test</p> <p>6 segments, correct?</p> <p>7 A. I don't recall the number of segments off</p> <p>8 the top of my head, but that seems reasonable.</p> <p>9 Q. Why don't we just refer to your report</p> <p>10 just so you can be satisfied that that's the right</p> <p>11 number. If you look at Page 30 of your report,</p> <p>12 you'll see that you tested the Cruze in city</p> <p>13 conditions over 1,825 miles, and that produced 278</p> <p>14 segments; is that right?</p> <p>15 A. Yeah.</p> <p>16 Q. And then on Page 32, you report that you</p> <p>17 tested the Cruze over 6,236 highway driving miles,</p> <p>18 and that produced 403 segments, correct?</p> <p>19 A. Yeah.</p> <p>20 Q. So 403 plus 278 is 681, correct?</p> <p>21 A. Yeah.</p> <p>22 Q. Okay. So if we can agree that you had</p> <p>23 reported 681 segments, correct?</p> <p>24 A. Yes.</p> <p>25 Q. Now, those segments that you created are</p>
<p>1 differences between your PEMS measurements on</p> <p>2 cloudy days versus sunny days?</p> <p>3 A. We did not.</p> <p>4 Q. Did you account for any potential</p> <p>5 differences between measurements when it was windy</p> <p>6 versus when it was still?</p> <p>7 A. We believed that running tests in a lot of</p> <p>8 different directions on a lot of different days,</p> <p>9 that the effects of wind would average themselves</p> <p>10 out. And that's consistent, in fact, with how a</p> <p>11 coast down, for example, would be performed to</p> <p>12 develop a road load model for a vehicle.</p> <p>13 Q. Okay. So the answer is you didn't account</p> <p>14 for any potential differences between windy and</p> <p>15 still days for the reason you just said, correct?</p> <p>16 A. I believe my answer was a little</p> <p>17 different. I believe that yes, we accounted for</p> <p>18 the fact that you have variability in wind by</p> <p>19 running, one, a large variety of tests in different</p> <p>20 directions to cancel out the effects of the wind,</p> <p>21 which is, in fact, the same procedure that's used</p> <p>22 to develop a road load model for a coast down.</p> <p>23 Q. Got it. Thank you.</p> <p>24 I'd like to direct your attention to an</p> <p>25 exhibit that was marked yesterday. It is</p>	<p>1 not of equal length, are they?</p> <p>2 A. In some cases, they are. In some cases,</p> <p>3 they aren't.</p> <p>4 Q. Nowhere in your report did you describe</p> <p>5 what methodology you used for deciding when one</p> <p>6 test segment ends and another test segment starts;</p> <p>7 is that right?</p> <p>8 A. I believe we described -- let's think. I</p> <p>9 don't know that we said explicitly, but the</p> <p>10 segments were divided up so that when a change in</p> <p>11 condition would come, that would generate a new</p> <p>12 segment. So for example, if the vehicle hit a road</p> <p>13 grade, it accounts for speed that would represent a</p> <p>14 new segment, and so the data was analyzed as a</p> <p>15 separate segment.</p> <p>16 Q. Is there anything in your report that</p> <p>17 explains when one segment starts and another one --</p> <p>18 when one segment ends and another one starts?</p> <p>19 A. I believe in the report, it describes the</p> <p>20 segments being broken up into data with similar</p> <p>21 characteristics.</p> <p>22 Q. Can you point me to that?</p> <p>23 A. So for example, a number of my analyses</p> <p>24 will say exactly what segments were included in the</p> <p>25 analysis.</p>

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16 (Pages 311 to 314)

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<p>1 Q. Okay, but there's nowhere -- unless I 2 missed it, there's nowhere in your report where you 3 describe what the methodology was that you used for 4 starting a segment or ending a segment?</p> <p>5 A. No. A segment is just simply a set of 6 conditions where, you know, things are not 7 changing. The speed profile is not changing. The 8 RPA is not changing, etcetera.</p> <p>9 Q. Do you have a written description of the 10 methodology that you used for deciding when one 11 segment ends, another one starts?</p> <p>12 A. I used my engineering judgment based on 13 when the conditions would change. So each of those 14 PowerPoint files, for example, you can see when you 15 go from one PowerPoint slide to the next, for 16 example, you might see speed change, or you might 17 see the introduction of a road grade. So if any of 18 those variables change, I would create a new file. 19 So I didn't feel like I needed written instructions 20 for something that was merely to me intuitive.</p> <p>21 Q. Okay. So in other words, there is no 22 written description of the methodology, correct?</p> <p>23 A. Correct.</p> <p>24 Q. You said that you used your engineering 25 judgment to decide when to start a segment or end a</p>	<p>1 route.</p> <p>2 Q. And when you were dividing these tests up 3 into segments, you had the NOx emission results, 4 correct?</p> <p>5 MR. WOJTANOWICZ: Object to the form.</p> <p>6 THE WITNESS: I would -- I would get a NOx 7 emission result for a particular segment, yes.</p> <p>8 BY MR. BRODSKY:</p> <p>9 Q. But even before you divided the trip up 10 into segments, you had the NOx emission results 11 from the entire trip, correct?</p> <p>12 A. Correct. And so one thing that's also 13 important to consider is that every segment that 14 was driven on this vehicle and tested with PEMS is</p> 
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<p>1 segment. Were you also given instructions by 2 plaintiffs' counsel in that regard?</p> <p>3 A. No.</p> <p>4 Q. When you decided and applied your 5 engineering judgment as to when a segment would 6 start and when it would stop, you, obviously, had 7 all the data from the test drives in front of you, 8 correct?</p> <p>9 MR. WOJTANOWICZ: Object to the form.</p> <p>10 THE WITNESS: I just went along file by file 11 and would divide things up. So you know, for 12 example, I would see variable speed. I would have 13 that as a variable speed segment on a flat road. 14 If I saw that then the condition changed to 15 variable speed on a hill, that would be a new 16 segment. If the segment then changed or the data 17 then changed to a steady speed at 60 miles an hour 18 on a flat road, that would represent a new segment. 19 If that flat road then became a hill, that would 20 represent a new segment.</p> <p>21 And the point is that we can then analyze 22 the data for segments that share common features, 23 which is a more sophisticated way of looking at the 24 data than some of the studies that preceded what we 25 did where they simply would drive the vehicle on a</p>	

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17 (Pages 315 to 318)

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	<p>1 temperature of the catalyst for purposes of proper 2 injection of the hydrocarbon over the surface of 3 the catalyst. 4 The preferred method would have been to 5 drill a hole in the side of the casing of the 6 system and run a thermal couple into that catalyst 7 brick. However, because of hardware limitations, 8 that wasn't practical, and so instead, we developed 9 a temperature model to interpolate the temperature 10 between the measured inlet and measured outlet 11 temperature of the catalyst head. 12 And so generally speaking, again, a direct 13 measurement, of course, with a piece of equipment 14 that's reliably measuring the thing directly is 15 more desirable than a modeled temperature.</p> <p>16 Q. So you claim that the Cruze's 17 environmental temperature model results in readings 18 that are 4 and a half degrees Fahrenheit higher 19 than your PEMS temperature measurement in city 20 driving and 2.9 degrees Fahrenheit higher in 21 highway driving; is that correct? That's at 22 Page 91 of your report.</p> <p>23 A. Yeah. That's what we measured.</p> <p>24 Q. And you've already said that model 25 environmental temperature isn't inherently</p>
<p>19 Q. It's not your position that modeling 20 environmental temperature is inherently unreliable 21 or improper, is it?</p> <p>22 A. No. Modeling -- a proper temperature 23 model could be a useful tool.</p> <p>24 Q. And it's not your position that hardware 25 sensors are inherently more reliable than model</p>	
<p>1 temperatures, is it?</p> <p>2 A. I would say a hardware sensor properly 3 located generally would be more accurate than a 4 model depending on how it's set up.</p> <p>5 Q. What's -- what's your basis for that 6 statement?</p> <p>7 A. Years of experience using sensors. 8 Generally speaking, you'd like to avoid using a 9 model if you can and measure the variable that 10 you're interested in. Modeling only comes in when 11 you can't measure the variable that you're 12 interested in.</p> <p>13 Q. Do you have any more concrete backup for 14 that claim other than just saying your years of 15 experience?</p> <p>16 A. I'm not sure how much more concrete I can 17 make it. I've been trained in the design of 18 chemical facilities and reactors and have, for 19 example, come up with my own models of -- for 20 example, in our design of our hydrocarbon SCR 21 system at my old company, Cleaire, we wanted to 22 know the internal temperature of the SCR system.</p> <p>23 So the SCR system was comprised of two 24 bricks in a can. And in order to design the 25 system, we wanted to know what is the internal</p>	<p>1 unreliable. So you accept that some margin between 2 the actual ambient temperature and the model 3 temperature is to be expected, correct?</p> <p>4 MR. WOJTANOWICZ: Object to the form.</p> <p>5 THE WITNESS: That's a mischaracterization of 6 testimony. I didn't say that a model temperature 7 is unreliable. I said that generally direct 8 measurement is more reliable. That doesn't mean 9 the model is inherently reliable. So I believe 10 that misstates what I said.</p> <p>11 And furthermore, if you look at the 12 temperature of the gasoline Cruze, they're able to 13 accurately measure the ambient temperature in that 14 vehicle. So clearly, it's within GM's capability 15 to obtain a proper environmental temperature.</p> <p>16 BY MR. BRODSKY:</p> <p>17 Q. The procedure for the SC03 test is 18 conducted at 95 degrees Fahrenheit, correct?</p> <p>19 A. Correct.</p> <p>20 Q. And the regulations allow for a margin of 21 more than 5 percent -- I'm sorry, 5 degrees 22 Fahrenheit for the testing environment, correct?</p> <p>23 A. Okay.</p> <p>24 Q. Do you know that to be true?</p> <p>25 A. I don't believe it's that high, but I</p>

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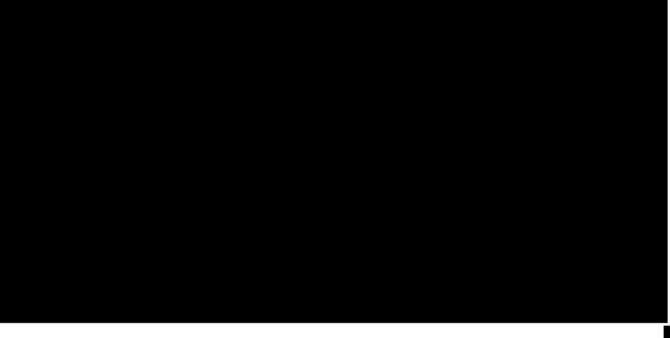
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18 (Pages 319 to 322)

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1 would have to go look at the regs.
 2 Q. Would you like me to show you the regs?
 3 A. I'll take it for -- take your word for the
 4 moment.
 5 Q. Okay. I think the wording of the regs is
 6 the ambient temperature is 35 degrees Celsius plus
 7 or minus 3 degrees Celsius. So I was using the
 8 Fahrenheit version to say 5 degrees or so.
 9 A. Okay.
 10 Q. So the SC03 procedure acknowledges that
 11 the exact temperature measurements and conditions
 12 aren't always attainable, correct?
 13 MR. WOJTANOWICZ: Object to the form.
 14 THE WITNESS: I would say that they give you a
 15 margin around which to hit the target temperature.



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3 BY MR. BRODSKY:
 4 Q. I'm not talking about a particular case.
 5 I'm talking about just the fact that NOx emissions
 6 could be higher above 95 degrees. Is that in and
 7 of itself evidence of a defeat device?
 8 MR. WOJTANOWICZ: Asked and answered.
 9 THE WITNESS: I believe the regulators would
 10 consider high NOx emissions at that level
 11 potentially a defeat device.
 12 BY MR. BRODSKY:
 13 Q. Really? In and of itself just having NOx
 14 emissions higher at that temperature, in and of
 15 itself, is a defeat device?
 16 A. It could potentially be. Again, the
 17 context is important. You can't answer that
 18 question without context.
 19 Q. Okay.
 20 A. That's why I say in the context of this
 21 case, which is the only important context,
 22 operation above 95 degrees Fahrenheit is the result
 23 of a defeat device.
 24 Q. And you would agree that soot and
 25 particulate matter can negatively affect engine



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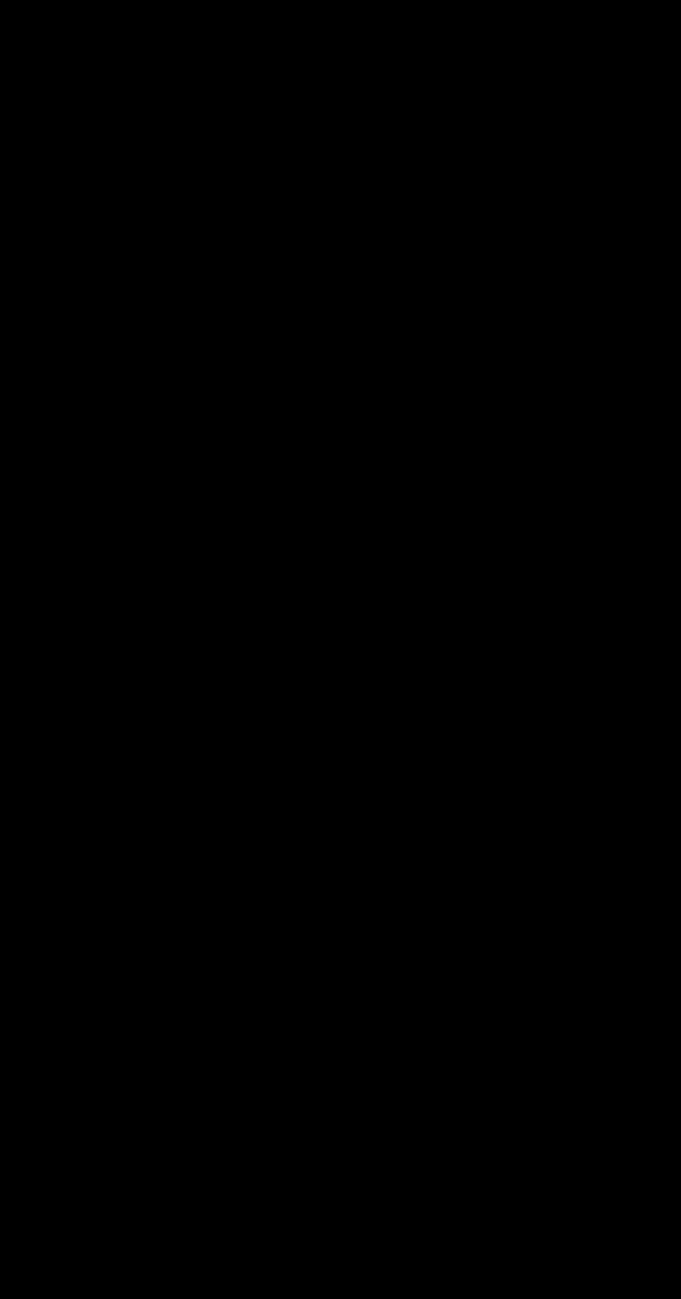
<p style="text-align: right;">Page 323</p> <p>1 performance as a general matter? 2 A. Be more specific with your question. 3 Q. If the engine generates soot and 4 particulate matter, that can negatively affect its 5 performance? 6 MR. WOJTANOWICZ: Object to the form. 7 THE WITNESS: All engines generate soot and 8 particulate matter, and it doesn't necessarily 9 impact their performance. 10 BY MR. BRODSKY: 11 Q. But soot and particulate matter can affect 12 a diesel engine's performance, correct? 13 A. All -- 14 MR. WOJTANOWICZ: Object to the form. 15 THE WITNESS: -- diesel engines generate soot 16 and particulate matter without an effect to their 17 performance. They can, but I would need more 18 context with the question. What are you asking 19 specifically? 20 BY MR. BRODSKY: 21 Q. I'm asking is it the case that soot and 22 particulate matter can negatively affect the 23 engine's performance? 24 MR. WOJTANOWICZ: Object to the form. 25 THE WITNESS: And without any concrete</p>	<p style="text-align: right;">Page 325</p>
<p style="text-align: right;">Page 324</p> <p>1 examples. I suppose yes, in theory, they can.</p>	<p style="text-align: right;">Page 325</p> <p>21 BY MR. BRODSKY: 22 Q. So do you claim that the EPA requires 23 emissions controls to be as effective for 24 controlling NOx at ambient temperatures above 25 100 degrees Fahrenheit as they would at lower</p>

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20 (Pages 327 to 330)

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<p>1 temperatures?</p> <p>2 A. That's their stated policy</p> 	<p>1 A. I don't recall off the top of my head.</p> <p>2 Q. It's more than the FTP standard, isn't it?</p> <p>3 A. I believe it is.</p> <p>4 Q. Isn't it true that regulators don't expect</p> <p>5 cars to perform the same under non-FTP standards</p> <p>6 than they do under FTP standards?</p> <p>7 MR. WOJTANOWICZ: Object to the form.</p> <p>8 BY MR. BRODSKY:</p> <p>9 Q. They're different standards for different</p> <p>10 tests. Doesn't that tell you that regulators</p> <p>11 expect vehicles to perform differently under</p> <p>12 non-FTP standards than they do under FTP standards?</p> <p>13 A. I guess I'm not understanding your</p> <p>14 question. It's a little bit vague.</p> <p>15 Q. It's pretty clear that you're not</p> <p>16 understanding my question. Let me say it one more</p> <p>17 time.</p> <p>18 MR. WOJTANOWICZ: Objection. You don't need to</p> <p>19 add commentary to the questions here. You're</p> <p>20 entitled to ask him questions.</p> <p>21 BY MR. BRODSKY:</p> <p>22 Q. Isn't it the case that regulators don't</p> <p>23 require vehicles to perform the same under non-FTP</p> <p>24 standards or under non-FTP conditions as they do</p> <p>25 under FTP conditions?</p>
<p>17 BY MR. BRODSKY:</p> <p>18 Q. What -- what's the standard for NOx under</p> <p>19 the FTP test?</p> <p>20 A. In this case, 70 milligrams per mile at</p> <p>21 full useful life.</p> <p>22 Q. Okay. What's the standard under the SC03</p> <p>23 test?</p> <p>24 A. I don't recall off the top of my head.</p> <p>25 Q. It's about double 70, isn't it?</p> 	<p>1 A. So the regulators have come up with a</p> <p>2 variety of test -- dynamometer test schedules as</p> <p>3 you alluded to, and I believe the expectation is</p> <p>4 that when the vehicle is operating in conditions</p> <p>5 substantially similar to that particular test, that</p> <p>6 the emissions would be on road indicative of what</p> <p>7 you saw on that particular test.</p> <p>8 Q. And when the conditions are different, the</p> <p>9 expectation is that the emissions are going to be</p> <p>10 different, correct?</p> <p>11 A. Correct.</p> <p>12 MR. WOJTANOWICZ: Object to the form.</p>

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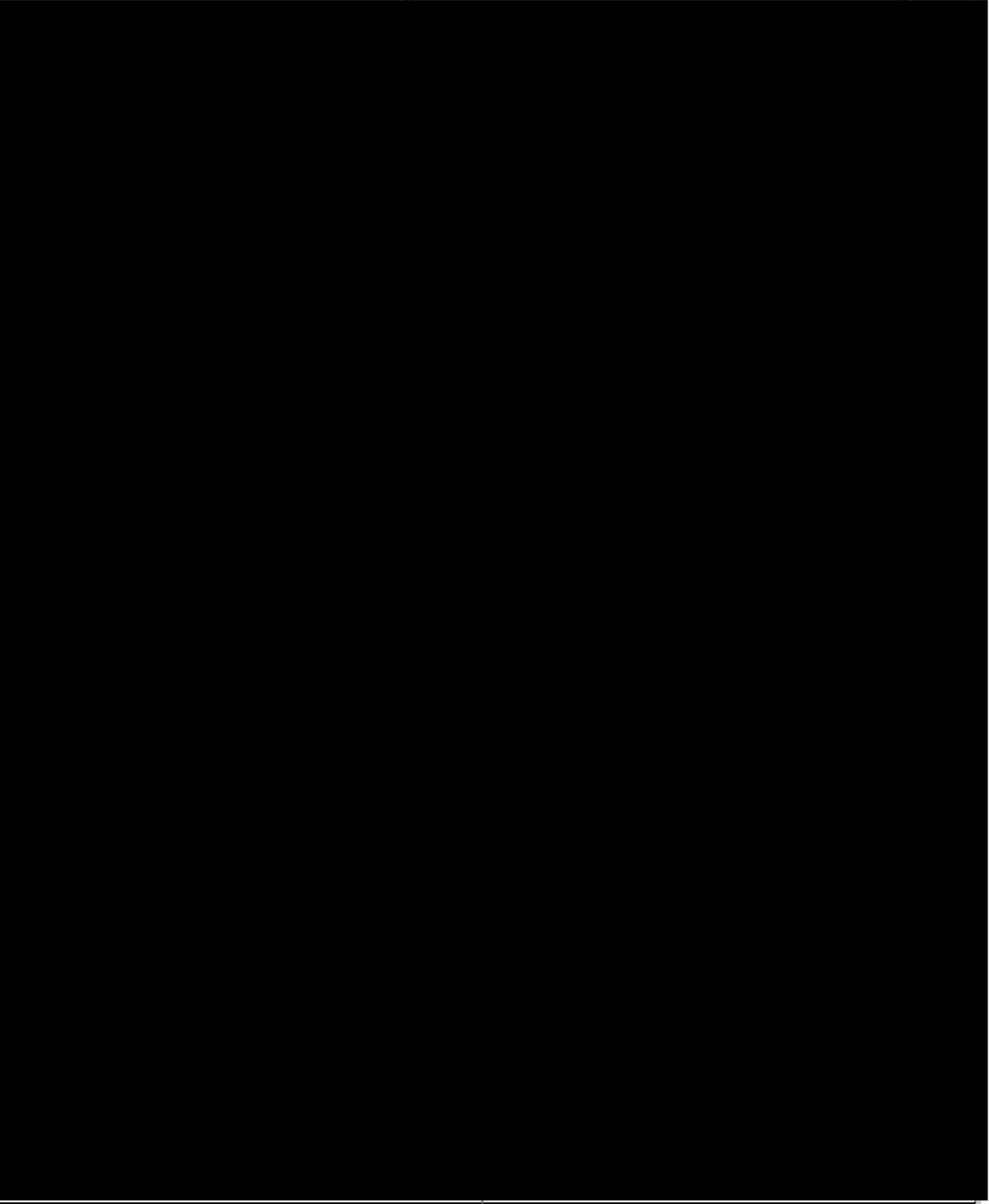
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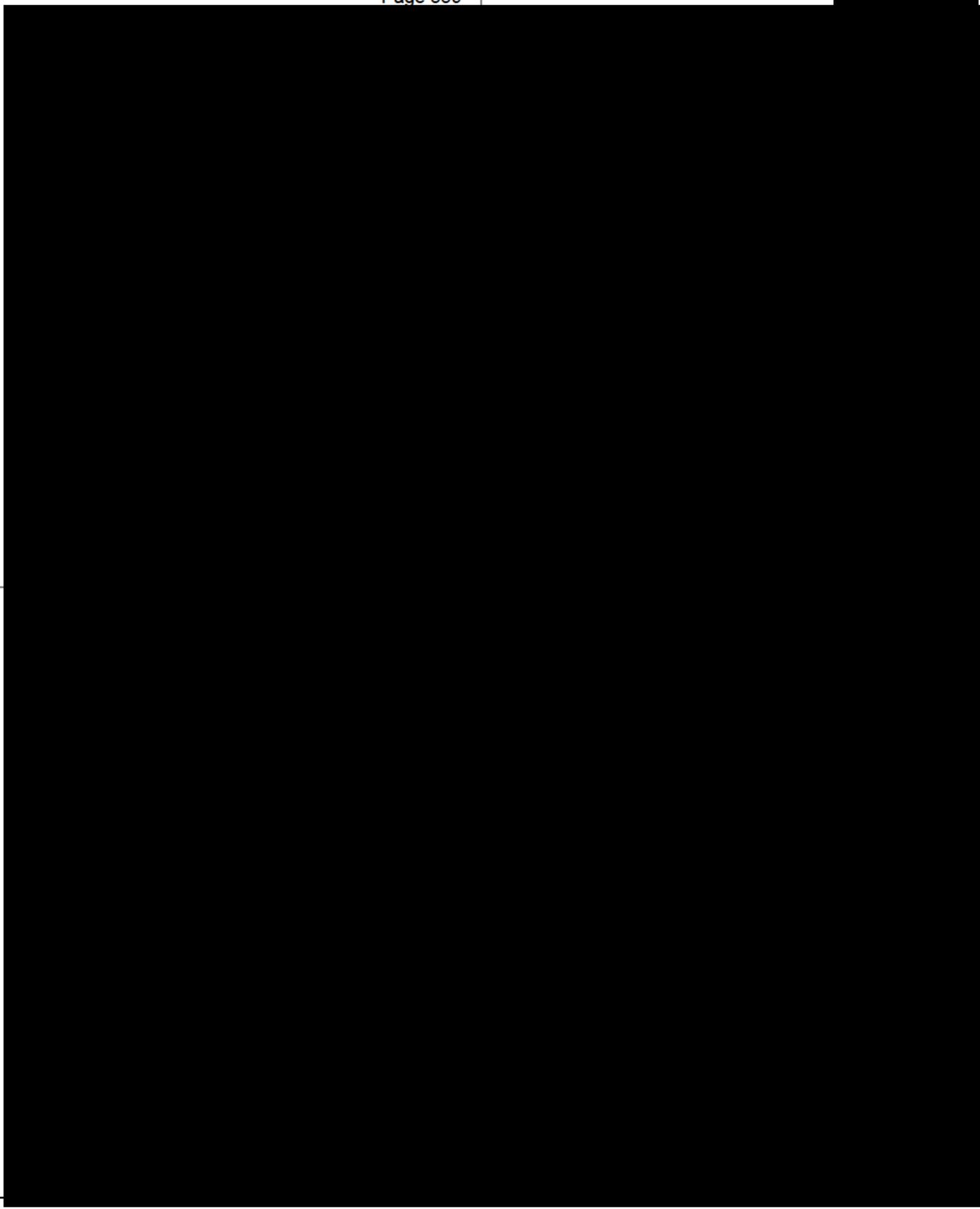
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23 MR. WOJTANOWICZ: We've been going about an
24 hour.
25

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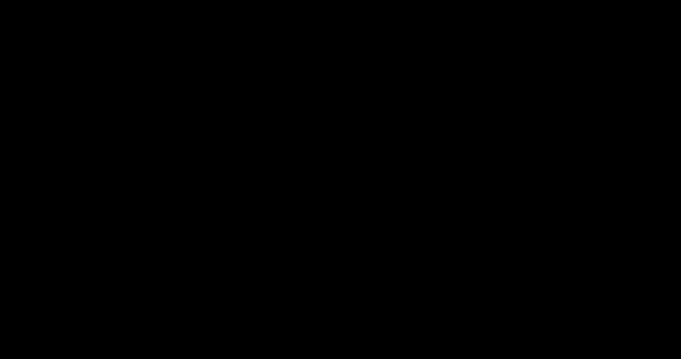
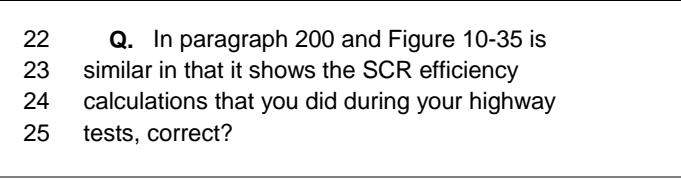
1 BY MR. BRODSKY:
2 Q. You also did an after --
3 MR. BRODSKY: I'm just getting to the good
4 part. Okay. We'll take a break.
5 MR. WOJTANOWICZ: I'm just trying to get -- two
6 things. One, it's about an hour, and two, we'll
7 see if we can adjust Juston's low bandwidth issue
8 or at least try troubleshoot that because I think
9 we've got a lag happening here. Can we take
10 10 minutes here to give us time to see if we can --
11 MR. BRODSKY: Okay. Why don't we -- we'll take
12 a 10-minute break then.
13 MR. WOJTANOWICZ: Is it okay if we take
14 10 minutes then?
15 MR. BRODSKY: Yeah. Yeah.
16 THE VIDEOGRAPHER: We're going off the video
17 record. The time is now 18:12 UTC.
18 (Whereupon, a short break was
19 taken.)
20 THE VIDEOGRAPHER: We are back on the video
21 record. The time is now 18:23 UTC. Go ahead.
22 BY MR. BRODSKY:
23 Q. Okay. Mr. Smithers, we had talked earlier
24 about the calculation you did of average engine-out
25 NOx mass flow. You also did a calculation of the

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<p>1 car's SCR conversion efficiency, correct?</p> <p>2 A. Correct.</p> <p>3 Q. Okay. You waited for a long time there.</p> <p>4 I thought maybe the lag had returned. Can you hear</p> <p>5 me?</p> <p>6 A. I answered right away.</p> <p>7 Q. I think the lag is back. Let's keep</p> <p>8 going, but --</p> <p>9 A. I'll dial in with the mobile.</p> <p>10 THE VIDEOGRAPHER: Do you want to go off the</p> <p>11 video record?</p> <p>12 MR. BRODSKY: Let's go off the record for a</p> <p>13 second.</p> <p>14 THE VIDEOGRAPHER: Going off the video record.</p> <p>15 The time is now 18:24 UTC.</p> <p>16 (Whereupon, a short break was</p> <p>17 taken.)</p> <p>18 THE VIDEOGRAPHER: We are back on the video</p> <p>19 record. The time is now 18:27 UTC. Go ahead.</p> <p>20 BY MR. BRODSKY:</p> <p>21 Q. Mr. Smithers, we had previously talked</p> <p>22 about your calculation of engine-out NOx mass flow.</p> <p>23 You also did an after-the-fact calculation of the</p> <p>24 car's SCR conversion efficiency, correct?</p> <p>25 A. Yes.</p>	<p>1 A. I don't believe we did in this test or in</p> <p>2 this data set.</p> <p>3 Q. How would your results change if you</p> <p>4 filtered out tests with ambient temperatures</p> <p>5 outside the FTP range?</p> <p>6 MR. WOJTANOWICZ: Object to the form.</p> <p>7 THE WITNESS: I would have to rerun the</p> <p>8 analysis.</p> 
<p>1 Q. And you took your calculated upstream NOx</p> <p>2 mass flow measured over a specific distance and</p> <p>3 compared it to the downstream NOx value measured by</p> <p>4 your PEMS machine over that same distance, correct?</p> <p>5 A. Correct.</p> <p>6 Q. And I want to turn you to paragraph 199</p> <p>7 and Figure 10-33 of your report. It's on Page 81.</p> <p>8 And those summarize the SCR efficiency calculation</p> <p>9 that you did for your city driving tests, correct?</p> <p>10 A. Paragraph 199?</p> <p>11 Q. Paragraph 199 and Figure 10-33.</p> <p>12 A. Yes.</p> <p>13 Q. Okay. And in reporting those results, you</p> <p>14 filtered out active regenerations, hot starts and</p> <p>15 cold starts, correct?</p> <p>16 A. Right.</p> <p>17 Q. Did you filter out anything else?</p> <p>18 A. No. Hot starts, cold starts and active</p> <p>19 regions tend to drive the emissions up.</p> <p>20 Q. You didn't filter out tests with extremely</p> <p>21 high ambient temperatures or extremely low ambient</p> <p>22 temperatures?</p> <p>23 A. I don't believe I did in these plots.</p> <p>24 Q. And you didn't filter out tests with steep</p> <p>25 road grades?</p>	<p>22 Q. In paragraph 200 and Figure 10-35 is</p> <p>23 similar in that it shows the SCR efficiency</p> <p>24 calculations that you did during your highway</p> <p>25 tests, correct?</p> 
<p>1 Q. And you took your calculated upstream NOx</p> <p>2 mass flow measured over a specific distance and</p> <p>3 compared it to the downstream NOx value measured by</p> <p>4 your PEMS machine over that same distance, correct?</p> <p>5 A. Correct.</p> <p>6 Q. And there you filtered out active</p> <p>7 regenerations?</p> <p>8 A. I believe we did.</p> <p>9 Q. And this time for this paragraph in this</p> <p>10 figure, you did not filter out hot starts or cold</p> <p>11 starts, correct?</p> <p>12 A. I don't believe there were any. I think</p> <p>13 that's why we didn't filter them out.</p> <p>14 Q. You didn't filter out tests with extremely</p> <p>15 high ambient temperatures or extremely low ambient</p> <p>16 temperatures?</p> <p>17 A. We did not.</p> <p>18 Q. And you didn't filter out any results with</p> <p>19 steep road grades?</p> <p>20 A. I don't believe we did.</p> <p>21 Q. How would your results change if you</p> <p>22 filtered out tests with ambient temperatures</p> <p>23 outside the HWFET range?</p> <p>24 A. I'd have to rerun the analysis.</p> <p>25 MR. WOJTANOWICZ: Object to the form.</p> <p>26 THE WITNESS: The point of these plots is to</p> <p>27 show the relative commonness of high SCR</p> <p>28 efficiency, SCR efficiency above, say, 90 percent.</p> <p>29 So --</p>	<p>1 A. Correct.</p> <p>2 Q. And there you filtered out active</p> <p>3 regenerations?</p> <p>4 A. I believe we did.</p> <p>5 Q. And this time for this paragraph in this</p> <p>6 figure, you did not filter out hot starts or cold</p> <p>7 starts, correct?</p> <p>8 A. I don't believe there were any. I think</p> <p>9 that's why we didn't filter them out.</p> <p>10 Q. You didn't filter out tests with extremely</p> <p>11 high ambient temperatures or extremely low ambient</p> <p>12 temperatures?</p> <p>13 A. We did not.</p> <p>14 Q. And you didn't filter out any results with</p> <p>15 steep road grades?</p> <p>16 A. I don't believe we did.</p> <p>17 Q. How would your results change if you</p> <p>18 filtered out tests with ambient temperatures</p> <p>19 outside the HWFET range?</p> <p>20 A. I'd have to rerun the analysis.</p> <p>21 MR. WOJTANOWICZ: Object to the form.</p> <p>22 THE WITNESS: The point of these plots is to</p> <p>23 show the relative commonness of high SCR</p> <p>24 efficiency, SCR efficiency above, say, 90 percent.</p> <p>25 So --</p>

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27 (Pages 355 to 358)

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<p>1 BY MR. BRODSKY:</p> <p>2 Q. So paragraph 199, which is the city 3 driving paragraph, refers to your calculated 4 conversion efficiency during city driving and says 5 that 41 percent of the tests had conversion 6 efficiencies of less than 80 percent. Do you see 7 that?</p> <p>8 A. Right. Yeah.</p> <p>9 Q. What -- what constitutes a test?</p> <p>10 A. A segment in that case.</p>	<p>8 Q. You do concede that the temperature of a 9 catalyst greatly affects its conversion efficiency?</p> <p>10 A. To a point.</p> <p>11 Q. On Page 15 of your report, you included a 12 graph --</p> <p>13 A. Yes.</p> <p>14 Q. -- that shows the relationship between 15 exhaust inlet temperature and NOx conversion 16 efficiency, correct?</p> <p>17 A. I did.</p> <p>18 Q. And this graph shows three different kinds 19 of catalysts?</p> <p>20 A. Yeah.</p> <p>21 Q. And the Cruze has a copper Z-like 22 catalyst, correct?</p> <p>23 A. It does.</p> <p>24 Q. So meaning that -- that's the blue line in 25 this chart, correct?</p>
	<p style="text-align: right;">Page 358</p> <p>1 A. Right. Yep.</p> <p>2 Q. Okay. So your summary of city driving 3 data, and it's at Page 81 if you want to refer to 4 it, but your summary says that 84 percent of your 5 tests showed inlet temperatures to the SCR of 6 between 200 and 350 degrees Celsius, correct?</p> <p>7 A. Right.</p> <p>8 Q. And expected efficiencies for a copper 9 Z-like catalyst varies significantly in that 10 temperature range, don't they?</p> <p>11 A. I'd like to point you to the last page of 12 my report, Page 132, where we studied the effect of 13 SCR temperature on the SCR conversion efficiency.</p> <p>14 Q. Hang on one second.</p> <p>15 MR. WOJTANOWICZ: What page did you say? I'm 16 sorry.</p> <p>17 THE WITNESS: 132 of my expert report. You'll 18 see a plot that we ran during testing on the FTP. 19 This is the inlet temperature of the SCR, and the 20 circled area is the area of concern. In that area, 21 the average temperature was 196.1 Celsius, and the 22 average NOx reduction was 94.5 percent showing that 23 this catalyst is capable of very high conversion 24 efficiencies at temperatures of 196.1 and above.</p> <p>25</p>

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1 BY MR. BRODSKY:

2 Q. So what's the relevance of the chart on
3 Page 15 of your report, which shows that a copper
4 Z-like catalyst at 200 degrees Celsius could have a
5 conversion efficiency as low as 75 percent?

6 A. It was general informational to show that
7 this is the general window where these catalysts
8 are active, and it wasn't meant to be -- most of
9 this section is background section. It wasn't
10 meant to be interpreted as exactly specific to this
11 vehicle, but we did consider that, and that's why
12 we ran the test. So above 196 degrees, we expect a

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37 (Pages 395 to 398)

Page 395	Page 397
[REDACTED]	<p>1 A. It was. 2 Q. I think you said someone flew in on both 3 occasions? 4 A. Yes. 5 Q. And were there any written 6 memorizations of that training? 7 A. We went through the written documentation 8 of the procedures that Sensors goes through to 9 operate their PEMS system. So we followed their 10 written procedures. 11 Q. But is there anything memorializing that 12 that training occurred? 13 A. I'm sure we could go back and look at 14 receipts and things like that or calendar events if 15 we really doubted that that took place. 16 Q. We do want you to do that. We're entitled 17 to that. 18 A. Okay. 19 Q. Were there any written notes of that event 20 or any of those events of the training sessions? 21 A. I would have to go and ask those guys for 22 whatever notes they took. 23 Q. Were there e-mails setting up the training 24 sessions? 25 A. Potentially.</p>
[REDACTED]	<p>1 Q. We request all of that material, all the 2 material surrounding these supposed training 3 sessions. 4 Once the sessions occurred, what did you 5 do to ensure that the PEMS equipment was actually 6 used properly? 7 A. They followed the procedures in the PEMS 8 document, and there was a set of QA/QC data that's 9 stored in the PEMS equipment before and after 10 operation so you can validate that the test was run 11 properly. We also maintained the equipment per the 12 manufacturer's schedule. We maintained the roughly 13 monthly 10-point calibrations, which I believe 14 you've been supplied with, calibrated with gases 15 that were according to the spec. 16 Our 10-point gas divider was calibrated 17 according to the spec on the -- at the frequency 18 recommended by the manufacturer. The PEMS units 19 themselves were calibrated on a semiannual basis, I 20 believe, or, perhaps, annual basis, whatever the 21 manufacturer spec is. The Sensor's weather probe 22 is calibrated on an either semiannual or annual 23 basis. The exhaust flow meters are calibrated on a 24 semiannual basis. 25 So these units are all checked to ensure</p>

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39 (Pages 403 to 406)

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<p>1 MR. WOJTANOWICZ: Renee, hold on. The audio is 2 pretty bad, Renee. I don't know if there's 3 something you can do.</p> <p>4 THE VIDEOGRAPHER: Do you want to go off the 5 video?</p> <p>6 MR. BERMAN: Let's go off video a second.</p> <p>7 THE VIDEOGRAPHER: Going off the video record. 8 The time is 20:27.</p> <p>9 (Whereupon, a short break was 10 taken.)</p> <p>11 THE VIDEOGRAPHER: Back on the video record. 12 The time is now 20:31 UTC. Go ahead.</p> <p>13 BY MS. SMITH:</p> <p>14 Q. Good afternoon, Mr. Smithers. Sorry for 15 the interruption.</p> <p>16 Are you testifying that the Cruze diesel 17 should have the same NOx emissions as the Cruze 18 gasoline vehicle?</p> <p>19 A. I think that there's two parts to that 20 answer. The first part is, and maybe you guys are 21 getting tired of me referencing this section, but 22 I'll go to paragraph 251 of my report. And again, 23 I think this guidance is useful because it's been 24 around since the '70s. As early as 1972, EPA 25 states that it is the intent of the Clean Air Act</p>	<p>1 certification cycle, the NOx emissions standard was 2 70 milligrams per mile, correct? 3 A. Correct. 4 Q. And the prescribed standard for the 5 gasoline Cruze at the time was Tier 2 Bin 4, 6 correct? 7 A. Yep. 8 Q. And that meant that the NOx emissions on 9 the FTP certification cycle would be no higher than 10 40 milligrams per mile, correct? 11 A. Correct. 12 Q. One second. I'm doing a calculation here. 13 The standard for the Cruze diesel was not slightly 14 higher in terms of NOx emissions than the gasoline 15 vehicle, was it? 16 A. In the context -- 17 MR. WOJTANOWICZ: Object to the form. 18 THE WITNESS: -- of the emissions that we 19 measured, I'm sorry to say that it is. 20 BY MS. SMITH: 21 Q. I'm sorry. I'm asking you if the standard 22 for NOx emissions for the diesel vehicle was 23 slightly higher than the gas vehicle? Is that what 24 you're testifying that that's slightly higher? 25 A. Yeah. So in the context of the emissions</p>
Page 404	Page 406
<p>1 that the vehicles designed -- I'm sorry. Vehicles 2 be designed, built and equipped so that when 3 they're being used by the motoring public, 4 emissions will be reduced to the extent indicated 5 by the prescribed standards during the period of 6 their useful life. So when they're being used by 7 the motoring public, emissions will be reduced to 8 the extent indicated by the prescribed standards. 9 So in this case, the Cruze diesel is 10 certified to a Tier 2 Bin 5 standard, which is 11 slightly higher than the Tier 2 Bin 4 standard of 12 the Cruze gasoline. They're very close. So based 13 on those two facts and EPA's policy, I would 14 testify that yes, I would expect the emissions 15 performance of those vehicles to be true to the 16 standards to which they were certified. 17 Q. There are several things in there. You 18 testified that it should be true to the prescribed 19 standards, right? 20 A. Right. 21 Q. Okay. And prescribed standards for the 22 Chevy Cruze diesel vehicle at that time was Tier 2 23 Bin 5, correct? 24 A. Correct. 25 Q. And that meant that on the FTP</p>	<p>1 that we're talking about, I do believe that is only 2 a slight increase. 3 Q. You believe that 40 versus 70 is only a 4 slight increase? 5 A. Given that the -- 6 Q. That's all I want to know. I just want to 7 know is that -- is that -- you're testifying that a 8 70-milligram-per-mile differentiation over 40 9 milligrams per mile is just slightly higher? 10 That's what you're going to -- 11 MR. WOJTANOWICZ: Renee, he was -- Renee, 12 please don't interrupt the witness. He was about 13 to answer the question. 14 BY MS. SMITH: 15 Q. Do you want to hear my question again? I 16 didn't mean to interrupt you. 17 A. No. I think -- yeah, I get your point. 18 It's 30 milligrams higher. It's 75 percent higher 19 than 40, and you could look at it that way that 20 it's a much higher standard. However, when you 21 look at the emissions that you get in the Cruze 22 diesel, on average, the emissions from the Cruze 23 diesel in city conditions is 4.1 times that 24 standard. 25 Let me find the number so I don't</p>

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<p>1 misspeak. The average is 288, and for the 2 gasoline, it's 16. In highway conditions, the 3 average is 220, and for the gasoline, it's 3. So 4 the difference between the standards in this case 5 is in the noise and the difference between the real 6 world emissions, and that's my point.</p> <p>7 Q. Okay. My question to you is just is the 8 standard for emissions for the gasoline vehicle 9 significantly lower than for the diesel vehicle? 10 That's all I want to know.</p> <p>11 A. It is lower than the diesel vehicle.</p> <p>12 Q. Thank you.</p> <p>13 I want to ask you some questions about 14 road grade calculations if I could.</p> <p>15 MR. WOJTANOWICZ: Hold on, Renee. Can I ask is 16 this -- this is a redirect here. The scope of this 17 examination should be, you know, topics that were 18 brought up and that you couldn't have done on your 19 direct examination.</p> <p>20 MS. SMITH: This is not actually redirect. 21 This is actually -- he passed the witness back to 22 me. You guys haven't asked questions yet.</p> <p>23 MR. WOJTANOWICZ: But you already passed the 24 witness over to Bosch. You don't get to toggle 25 back and forth.</p>	<p>1 altitude of the last second and divided by the 2 distance traveled for the segment?</p> <p>3 A. Yes.</p> <p>4 Q. Is it correct you don't provide any data 5 for drive time on road grade, just the highway 6 mileage?</p> <p>7 A. Time can be calculated from that.</p> <p>8 Q. But you don't calculate it, do you?</p> <p>9 A. I don't recall if I do or not.</p> <p>10 Q. In paragraph 129 of your report -- 11 MR. WOJTANOWICZ: Can you repeat that? I'm 12 sorry. I didn't get the number.</p> <p>13 MS. SMITH: I'm sorry. It's 129.</p> <p>14 MR. WOJTANOWICZ: Thank you.</p> <p>15 MS. SMITH: Page 45 and 46.</p> <p>16 THE WITNESS: Okay.</p> <p>17 BY MS. SMITH:</p> <p>18 Q. You write that less than 20 percent of the 19 highway mileage analyzed is flat. Roughly 20 40 percent of highway mileage in the United States 21 has a grade of 1 percent or more, and roughly 22 20 percent of highway mileage has a grade of 23 2.0 percent or more.</p> <p>24 Based on that distribution, it would, 25 therefore, be expected that the emissions from the</p>
<p>1 MS. SMITH: You know what, actually, I reserved 2 the right to ask additional questions when 3 Mr. Brodsky was done. And if you want me to come 4 up with reasons where I'm saying things are 5 relevant to things that he discussed with 6 Mr. Brodsky, I'm very capable of doing it. There 7 is no deposition protocol in this case, nowhere in 8 the rules that would prevent when there's time left 9 over me from continuing some questions. I will be 10 very short. I promise you.</p> <p>11 MR. WOJTANOWICZ: Okay. I'm not going to waive 12 our objections, but you know, we'll see where this 13 goes.</p> <p>14 MS. SMITH: And I will say you'll see they 15 all -- every single thing I'm asking about is 16 related to things that he discussed with 17 Mr. Brodsky, okay?</p> <p>18 BY MS. SMITH:</p> <p>19 Q. So to calculate segment level grade, is it 20 correct you took the difference between the 21 elevation level at the start of a segment and the 22 elevation level at the end of a segment?</p> <p>23 A. Correct.</p> <p>24 Q. And you took the difference between the 25 GPS altitude of the first second and the GPS</p>	<p>1 Cruze diesel would be over six times the HWFET 2 emission standard 20 percent of the time; is that 3 correct? Did I read that correctly?</p> <p>4 A. Which paragraph are we looking at?</p> <p>5 Q. It's 129, and it carries over to Page 46.</p> <p>6 Actually, the paragraph I'm asking about is on 7 Page 46, the second sentence, less than 20 percent.</p> <p>8 A. Okay. Yeah.</p> <p>9 Q. Okay. Is it correct that just because 10 20 percent of the road grades in the U.S. had over 11 2.0 percent, that does not mean that 20 percent of 12 all driving time is also over that grade; is that 13 correct?</p> <p>14 A. No. This is a rough first approximation. 15 You would have to look at driving patterns to know 16 for sure.</p> <p>17 Q. Okay. And you have no data about driving 18 time on road grades above 2.0 percent, correct?</p> <p>19 A. I haven't taken that data, no.</p> <p>20 Q. And you didn't consult any such data when 21 designing the PEMS routes, correct?</p> <p>22 A. I did not.</p> <p>23 Q. You have no data about driving time on 24 road grades below zero percent, do you?</p> <p>25 A. On road grades below zero percent?</p>

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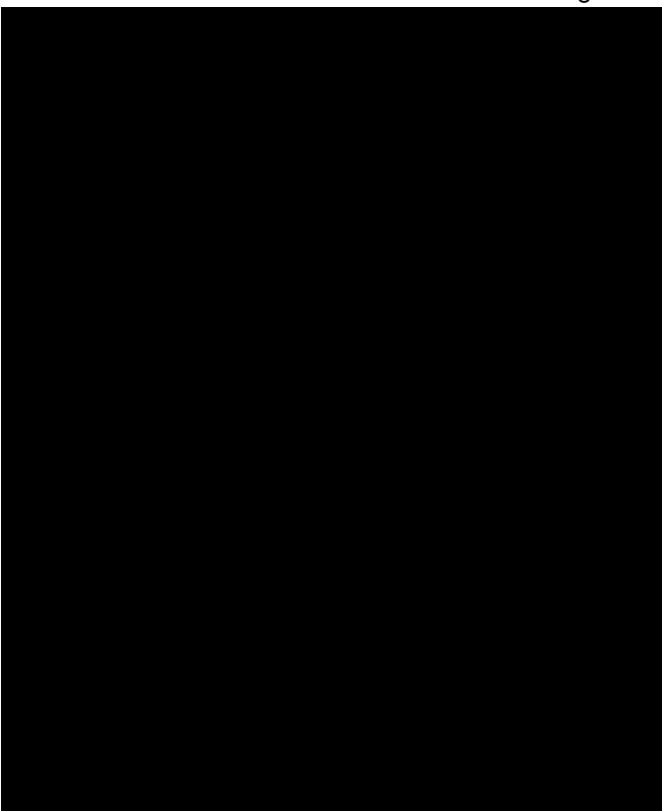
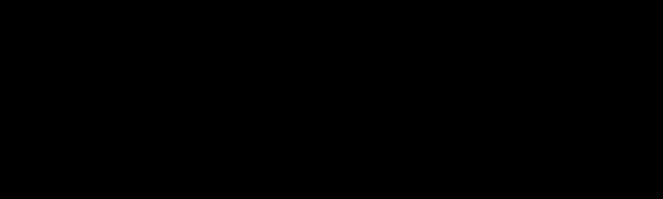
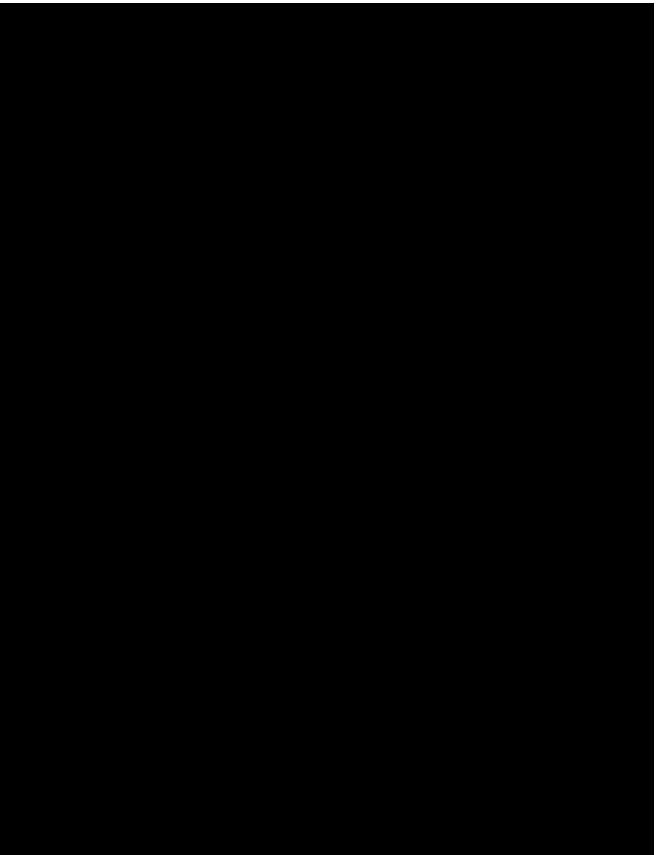
Page 411	Page 413
<p>1 Q. Correct.</p> <p>2 A. Well, they would be the same as the road</p> <p>3 grades above.</p> <p>4 Q. In terms of driving time?</p> <p>5 A. You're asking me about the time going down</p> <p>6 grade?</p> <p>7 Q. Correct.</p> <p>8 A. I don't have data on vehicle populations</p> <p>9 going down these highways, so no.</p> <p>10 Q. And you didn't consult such data when</p> <p>11 designing the PEMS routes, correct?</p> <p>12 A. I designed the PEMS routes to closely</p> <p>13 mimic the patterns of driving in the certification</p> <p>14 test cycles.</p> <p>15 Q. Is the answer no, you did not consult such</p> <p>16 data when designing the PEMS route?</p> <p>17 MR. WOJTANOWICZ: Object to form.</p> <p>18 BY MS. SMITH:</p> <p>19 Q. I'm sorry. Is it correct you did not</p> <p>20 consult data about driving time on road grade below</p> <p>21 zero percent when designing the PEMS routes?</p> <p>22 MR. WOJTANOWICZ: Object to the form.</p> <p>23 THE WITNESS: Correct.</p> <p>24 BY MS. SMITH:</p> <p>25 Q. And is it correct that by your own</p>	<p>1 in one direction and a negative road grade in the</p> <p>2 other direction. So yes, it captures both.</p> <p>3 Q. So the road grades listed are an absolute</p> <p>4 value of those grades. That is, for example, a</p> <p>5 1.3 percent road grade could be a positive or</p> <p>6 negative; is that correct?</p> <p>7 A. Correct.</p> <p>8 Q. As you sit here today, can you tell us</p> <p>9 with any degree of certainty what percentage in the</p> <p>10 U.S. -- excuse me.</p> <p>11 What percentage of roads in the U.S. have</p> <p>12 a road grade at or above 1.0 percent?</p> <p>13 A. I believe it's here in my report. Roughly</p> <p>14 40 percent of highway mileage in the United States</p> <p>15 has a grade of 1 percent or more.</p> <p>16 Q. Is that positive or negative?</p> <p>17 A. It's both.</p> <p>18 Q. You told Mr. -- I believe you told</p> <p>19 Mr. Brodsky that the impact of the AECDs must be</p> <p>20 quantified as part of a certification process. Do</p> <p>21 you remember that testimony?</p> <p>22 A. I do.</p> <p>23 Q. And I think you referred to the EPA</p> <p>24 advisory circular, which is an official guidance</p> <p>25 document?</p>
<p>1 numbers, roughly 80 percent of highway mileage in</p> <p>2 the United States has a grade of 2.0 percent or</p> <p>3 less?</p> <p>4 A. Correct.</p> <p>5 Q. And Figure 9-16, which is on Page 46 of</p> <p>6 your report, do you see that there?</p> <p>7 A. Yeah.</p> <p>8 Q. That figure purports to depict road grades</p> <p>9 on controlled access highways in the United States,</p> <p>10 correct?</p> <p>11 A. Right.</p> <p>12 Q. And the figure does not show any negative</p> <p>13 road grade, right?</p> <p>14 A. It's in a plot of absolute road grade.</p> <p>15 Q. Is it correct it does not show negative</p> <p>16 road grades?</p> <p>17 A. It's a plot of absolute road grade.</p> <p>18 Q. Does that depict negative road grades or</p> <p>19 not?</p> <p>20 A. Well, anything that's called an uphill in</p> <p>21 the other direction is a downhill. So yes, it</p> <p>22 shows you both uphill and downhill.</p> <p>23 Q. And so it -- the map captures both</p> <p>24 negative and positive road grade; is that fair?</p> <p>25 A. Any -- any hill is a positive road grade</p>	<p>1 A. Yes.</p> <p>2 Q. Could you tell us what is the EPA circular</p> <p>3 that you were referring to?</p> <p>4 A. I believe it's EPA Circular 24-3 in that</p> <p>5 case.</p> <p>6 Q. Was that the only authority that you were</p> <p>7 relying on for that statement?</p> <p>8 MR. WOJTANOWICZ: Object to the form.</p> <p>9 BY MS. SMITH:</p> <p>10 Q. Let me restate it.</p> <p>11 Is that EPA circular the only source for</p> <p>12 your statement that AECDs must be quantified?</p> <p>13 A. In this -- in the context of this report,</p> <p>14 yes.</p> <p>15 Q. Do you know whether any OEM provides</p> <p>16 quantified NOx emissions levels in its</p> <p>17 certification disclosures that go with the AECDs?</p> <p>18 A. I have not seen other OEM disclosures in</p> <p>19 full, so I can't comment.</p> <p>20 Q. Have you seen any from any OEM in the</p> <p>21 United States that quantifies NOx emissions levels</p> <p>22 in its certification disclosures?</p> <p>23 MR. WOJTANOWICZ: Object to the form. Asked</p> <p>24 and answered.</p>

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42 (Pages 415 to 418)

<p style="text-align: center;">Page 415</p> 	<p style="text-align: center;">Page 417</p> <p>1 you?</p> <p>2 A. I believe I've identified well within my</p> <p>3 area of expertise a series of defeat devices that</p> <p>4 manipulate the emissions results on those cycles.</p> <p>5 I have not made any prognostication in any of the</p> <p>6 things that I've said about intent. I'm merely</p> <p>7 saying that the data presented does not represent</p> <p>8 an accurate picture of the emissions from those</p> <p>9 AECDs.</p> <p>10 Q. You are not testifying here that General</p> <p>11 Motors manipulated anything, are you?</p> <p>12 A. General Motors manipulated, in cooperation</p> <p>13 with Bosch, the emissions results from the test</p> <p>14 cycles.</p> <p>15 Q. Are you saying General Motors intended to</p> <p>16 do that manipulation?</p> <p>17 A. I am.</p> <p>18 Q. Is that a core part of your opinion?</p> <p>19 A. It's a part of my opinion.</p> 
<p style="text-align: center;">Page 416</p> <p>1 BY MS. SMITH:</p> <p>2 Q. Mr. Smithers, I move to strike that as</p> <p>3 nonresponsive, and I'm going to just ask this</p> <p>4 question.</p> <p>5 Can you identify any OEM who provides</p> <p>6 actual numeric NOx levels in its AECD</p> <p>7 disclosures --</p> <p>8 MR. WOJTANOWICZ: Object to the form.</p> <p>9 THE WITNESS: General Motors.</p> <p>10 BY MS. SMITH:</p> <p>11 Q. -- with respect to emissions measures?</p> <p>12 A. General Motors supplied the SC03 in its</p> <p>13 AECD as representative of one of their AECDs. They</p> <p>14 supplied the cold CO as representative of another</p> <p>15 one of their AECDs.</p> <p>16 Q. I'm asking do they disclose -- quantify</p> <p>17 the NOx emissions level impacted by the AECDs?</p> <p>18 A. Those tests produce NOx emissions levels.</p> <p>19 Q. And are those disclosed?</p> <p>20 A. The tests are disclosed, yes.</p> <p>21 Q. Are the emissions levels disclosed?</p> <p>22 A. Such as they are manipulated, yes.</p> <p>23 Q. Okay. You understand you're here</p> <p>24 testifying as an expert, right? You're not</p> <p>25 testifying as an expert on companies' intent, are</p> 	

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43 (Pages 419 to 422)

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44 (Pages 423 to 426)

Page 423

Page 425

6 The question is while you were at Cleaire,
7 is it correct there would be issues that would come
8 up while you were developing things; yes or no?
9 A. I'm sorry. I hadn't finished --
10 Q. I withdrew the question.
11 A. -- answering your previous question.
12 Q. I withdrew it. It's gone.
13 I'm just asking whether --
14 A. The question you're asking now, I did not
15 get to complete my answer.
16 Q. Okay. I'm withdrawing that question.
17 So my question is while you were at
18 Cleaire, were there issues that would come up in
19 development sometimes?
20 A. Yes.
21 Q. And would you, as part of your -- as part
22 of your job, address those issues?
23 A. I would, and I would ensure that those
24 issues didn't make it into the final production
25 software, which wasn't the case for General Motors.

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45 (Pages 427 to 430)

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46 (Pages 431 to 434)

Page 431	Page 433
<p>1 MS. SMITH: Thank you, all. 2 THE VIDEOGRAPHER: This concludes today's 3 deposition. The time is now 21:12 UTC. 4 (FURTHER DEponent SAITH NAUGHT.) 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25</p>	<p>1 STATE OF ILLINOIS) 2) SS: 3 COUNTY OF C O O K) 4 I, GINA M. LUORDO, a notary public within 5 and for the County of Cook County and State of 6 Illinois, do hereby certify that heretofore, 7 to-wit, on May 21, 2020, remotely appeared before 8 me JUSTON SMITHERS, in a cause now pending and 9 undetermined in the United States District Court, 10 Eastern District of Michigan wherein JASON COUNTS, 11 et al. are the Plaintiffs, and GENERAL MOTORS LLC, 12 et al. are the Defendants. 13 I further certify that the said JUSTON 14 SMITHERS was first duly sworn to testify the truth, 15 the whole truth and nothing but the truth in the 16 cause aforesaid; that the testimony then given by 17 said witness was reported stenographically by me in 18 the presence of the said witness, and afterwards 19 reduced to typewriting by Computer-Aided 20 Transcription, and the foregoing is a true and 21 correct transcript of the testimony so given by 22 said witness as aforesaid. 23 I further certify that the signature to 24 the foregoing deposition was not waived by counsel 25 for the respective parties.</p>
<p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25</p> <p style="text-align: center;">JUSTON SMITHERS</p> <p>Subscribed and sworn to before me this _____ day of _____, 2020</p> <p>Notary Public</p>	<p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25</p> <hr/> <p style="text-align: right;">NOTARY PUBLIC, COOK COUNTY, ILLINOIS LIC. NO. 084-004143</p>

Counts, et al. v. General Motors LLC, et al., Case No. 1:16-cv-12541 (E.D. Mich.)
U.S. Legal Support

ERRATA SHEET – Volume I

Deponent: Juston Smithers
Deposition Date: May 20, 2020
Court Reporter: Gina M. Luordo, CSR, RPR, CRR.

The following corrections should be made to the transcript of my deposition taken on May 20, 2020:

Page Line Change

Page 21, line 23 – Should be “Mondial” instead of Mondale.

Page 28, line 3 – “diesel imaging control” should be “diesel emission control”

Page 30, line 7 – “long mile” should be “Longmile”

Page 30, line 11 – “saving” should be “saying”

Page 39, line 10 – “Tom” is “Tom Cackette”

Page 41, lines 13-14 – “Cases Hirz” is “KC Hur”

Page 41, line 21 – “Hirz” should be “Hur”

Page 106, line 1 – “euphemist” should be “euphemistic”

Page 144, line 12 – “max” should be “NOx”

Page 144, line 17-18 – “by the pounds of equipment” should be “by the PEMS equipment”

Page 161, line 3 – “ABL” should be “AVL”

Page 166, line 9 – “ADL” should be “AVL”

Page 168, line 25 – “Energy 44” should be “44 Energy”

Page 169, line 16 – “2008” should be “2018”

Page 171, line 2 – “chest” should be “test”

Page 173, line 15 – “MI” should be “M1”

Page 182, Line 15 – “Shank” should be “Schenk”

Page 195, line 13 – “form” should be “perform”

Page 196 line 10 and 11 – “Shank” should be “Schenk”. “Sandiz” should be “Sendiz”. “McHardy” should be “MacHardy”

Page 203, line 1 – “2006” should be “2016”

ERRATA SHEET – Volume II

Deponent: Juston Smithers

Deposition Date: May 21, 2020

Court Reporter: Gina M. Luordo, CSR, RPR, CRR.

The following corrections should be made to the transcript of my deposition taken on May 21, 2020:

Page Line Change

Page 265, line 7 – “merely” should be “fairly”

Page 272, line 19 – “Shank” should be “Schenk”

Page 277, line 9 – “expect” should be “exact”

Page 280, line 20 – “Shank” should be “Schenk”

Page 284, line 22 – “Shank” should be “Schenk”

Page 285, line 3 – “firms” should be “firm”

Page 285, line 12 – “Shank” should be “Schenk”

Page 285, line 12 – “equipments” should be “equipment”

Page 285, line 20 – “Shank” should be “Schenk”

Page 287, line 10 – “did” should be “said”

Page 299, line 4 – “bariatric” should be “barometric”

Page 317, line 6 – “thermal couple” should be “thermocouple”

Page 324, line 23 – “EGR rate” should have been “soot buildup”. I misspoke.

Page 327, line 24 – “1952” should be “1972”. Line 25 “1974 should be 1972”

Page 331, line 3 – “regulators” should be “GM”

Page 331, line 16 – “kilometers per hour” should be “miles per hour”

Page 337, line 14 – “lower” should be “molar”

Page 338, line 11 – “confuse” should be “could use”

Page 343, line 10 – “EMT” should be “VMT”

Page 343, line 22 – “miles” should be “percent”

Page 352, line 19 – “regions” should be “regens”

Page 357, line 21 – “copper z-like” should be “copper zeolite”

Page 358, line 8-9 – “copper z-like” should be “copper zeolite”

Page 359, line 4 – “copper z-like” should be “copper zeolite”

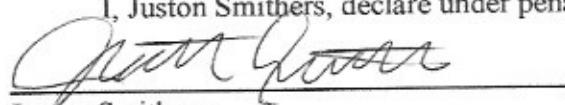
Page 363, line 7 – “increase” should be “decrease”

Page 377, line 3 – “that’s” should be “that”

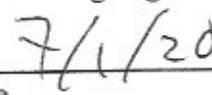
Page 388, line 7 – “examples” should be “exceptions”

Page 407, line 5 – “in the noise and the difference” should be “in the noise compared to the difference”

I, Juston Smithers, declare under penalty of perjury that the foregoing is true and correct.



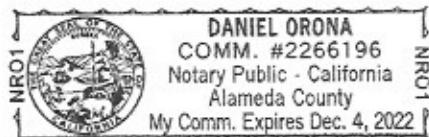
Juston Smithers


Date

STATE OF California)

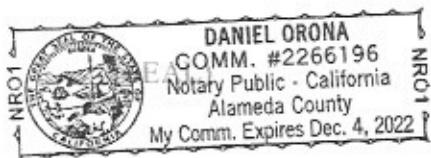
COUNTY OF Alameda)

Before me the undersigned, a Notary Public in and for their respective county and state, personally appeared Juston Smithers, and acknowledged the execution of this instrument this 1st day of July, 2020.



Notary Public Signature

Printed Name: Daniel Orona



In and for the State of California
My County of Residence: Alameda.
My Commissions Expires: 12/04/2022